APPENDIX D

Comments on the Columbia Area Water Supply EIS

Annotated Table of Contents

Introduction

The draft Environmental Impact Statement (EIS) on Future Water Supply Needs in the Upper Duck River Basin was distributed in August 2000. Members of the public and interested agencies provided comments on the draft EIS at a public meeting held on September 28, 2000, or by surface or electronic mail. Most comments on the draft EIS were received by October 30; however, some comments continued to arrive into early November 2000.

TVA received a total of 80 sets of comments on this draft EIS, including individual letters, letters from organizations and agencies, and verbal comments delivered either at the main session of the public meeting or in an individual comment room. These sets of comments include input from 57 individuals, one federal agency, seven state agencies, three identified county and local government agencies, and eight other organizations. Most of these sets of comments focused on only one or just a few issues; however, a few sets included many issues. The six sets of comments addressing ten or more separate issues have been reprinted here (starting on page D-4) to help clarify the full scope of those reviews of the draft EIS.

TVA has reviewed all of these sets of comments, has identified specific comments about the EIS contained in each of them, and has associated similar comments to produce the following list of 301 separate comments, each of which still identifies its original source(s). These comments are arranged in 21 sections, generally matching the major subject areas discussed in the EIS. Within each section, the comments are arranged with general issues first, then those for the subject action, then those opposed to it, followed by any alternative concepts. Usually simple comments are presented before longer ones, and basic comments are presented before complex ones. TVA staff have provided a response related to every comment, either individually or by clusters of clearly-related comments.

TVA and the cooperating agencies sincerely appreciate the time and thought a number of people have applied to the review of the draft EIS. Several concepts presented in these comments have been used to improve the content of the final EIS. These comments also will help the Duck River Agency and other local interests as they begin to make detailed decisions about how to meet future water needs of the upper Duck River basin.

Columbia Water Supply EIS Log Number 33
Environmental Science Graduate Students, University of Tennessee at Chattanooga

October 19, 2000

Linda B Oxendine
Tennessee Valley Authority
400 W Summit Hill Drive
Mailstop: WT 8C-K
Knoxville, Tennessee 37902

RE; DEIS - Future Water Supply Needs in the Upper Duck River Basin

Dear Ms. Oxendine,

Several Graduate Students of Environmental Science have reviewed the reference Draft Environmental Impact Statement (DEIS) and offer the following comments.

This letter is in opposition to all the alternatives proposed in your Draft Environmental Impact Statement on the Future Water Supply Needs in the Upper Duck River Basin We regard the proposed alternatives as a highly undesirable course of action for several reasons. However, if any of the proposed alternatives must be chosen we support Alternative C: Downstream Water Intake. **[F14]** Included below are our comments in addition to our criticisms in reference to Alternative C. Lastly. we recommend our own Alternative which was not considered in the DEIS

Section 5.2 Climate, Geology, and Soils

Adoption of Alternative C entails the development of a 13-mile pipeline and the subsequent construction of its downstream Duck River booster station. The sinkholes and caves at this venue often form delicate conduits or natural water pipes. There are concerns that during construction the sinkholes and caves may be impacted. Such impacts during construction might involve irreversible collapsing of the fragile karst topography quite possibly increasing the likelihood of ground water contamination. **[J2]**

The soils that are present in the Duck River area range from well to moderately well drained silty/loamy soils to highly acidic and low nutrient content soils. The silty/loamy soils are productive for a variety of different crops and considered prime farmland. Grazing cattle frequently use such soils. The economic cost of changing the land use of these yew productive agricultural areas merits further investigations before implementing Alternative C. **[R2]**

Section 5.3 - 5.4 Ground and Surface Water

From a water-quality point of view, we believe Alternative C will have the Least Minimal Impact (LMI) on water quality from both the natural reservoir and the reservoir Construction area is minimal and does not run the risk of contaminating water from exposed soil runoff or wiping out entire communities of organisms. The amount of water transferred is sufficiently small enough, greatly reducing the risk of affecting nutrient cycling and thermal stratification or the lowered dissolved oxygen levels within certain population parameters. **[K15]**

On the other hand, Alternative B will have the greatest effects on the quality of surface and ground water. The large area necessary for construction will have adverse effects on a complex array of aquatic ecosystems For example, by destroying undetermined species within the large non-surveyed areas, we cannot be certain of the impacts that one or perhaps three or four species disappearance would have on the system as a whole. **[L2]**

The extraction of soils necessary for construction would subject the nearby waters to high amounts of dissolved metals, petroleum and organic acids that have been long since trapped within the soils. This contamination could effectively lower the pH, possibly affecting nearby ground water tables. In addition, increased amounts of freshly killed plant matter and the introduction of carbon rich humus into the heterogeneous waters may cause many species of heterotrophic bacteria to bloom. Collectively, potential effects of lowering the dissolved oxygen content in the reservoir as well as increasing the chance for an outbreak of dangerous bacteria such as *Cryptosporidium* sp., *E coli* and other fecal coliform merits further rejection of Alternative B. **[K11]**

The modification of introducing cold oxygen depleted bottom water into the system will possibly further deplete the dissolved oxygen - possibly disrupting the complex thermal stratification layers in the water. Such a disruption could also interfere with nutrient cycling - a necessity for all life in aquatic systems. Accurate impact assessments dealing with such intricately complex cycles and oxygen depletion effects (often exponential) in Alternative B should be approached with caution. **[K9]**

Additionally, many bivalent metal ions tend to dissolve out of solution and into the soils over time However. a lowered pH and depleted dissolved oxygen will cause many metals (calcium, manganese, etc) to dissolve back into the water. This alone can have a hazardous effect upon humans via primary ingestion, secondary, ingestion or prolonged contact. **[K10]**

These reasons alone brand Alternative B unacceptable because of its effects on water quality. The issue is not just the previously elucidated factors that present danger or caution, but the infinite unforeseeable factors that may cause the greatest damage.

Section 5.5 Aquatic Life

There appear to be few impacts on the aquatic fauna associated with the adoption of Alternative C. Of the alternatives suggested by TVA, Alternatives C and E appear to be the most reasonable alternatives concerning aquatic life. Due to the relatively low amount of water that is being withdrawn from the proposed site in Alternative C, few negative effects would be likely. Sedimentation from construction could present localized problems in terms of disturbing habitats of benthic and lithophilic species, especially certain percid and cyprind fishes which utilize these habitats for spawning (12 darter species and 16 shiner/chub species). **[L4]**

Additionally, there is concern that the project may pose some localized threats to the mollusk fauna, as they too are sensitive to sedimentation from construction activities Fortunately, the mollusk fauna at the potential withdrawal site (RM 104) does not contain some of the more sensitive mussel species *(Epioblasma* sp., *Lemiox* sp.). However, little or no survey data concerning the gastropod fauna from this rcach is available. Given the presence of an endemic gastropod in the Duck River system *(Lithasia genticulata),* and the rich species diversity present in the Duck, it is incumbent on TVA to conduct a gastropod inventory in this proposed withdrawal area. TVA needs to be aware of what aquatic fauna is to be reasonably affected by a withdrawal station. **[L5]**

Section 5.6 Wetlands

As previously stated in the DE1S, the implementation of Alternative C would have short-term minor effects on some known wetlands. The minor effects are further defined as probable minimal construction effects in the DEIS. The severity of the minor short-term effects is apparently dependent on the proper siting, design, and construction of the contiguous facilities. Long-term effects and net loss or total displacement assessments for those wetlands are not adequately addressed in the DEIS. The issues below merit investigations before selection of Alternative C, albeit it is the nominee. The wetlands in peril need proper denotations as either forested and scrub-shrub type or emergent type wetlands. **[M1]** Furthermore, a vascular and non-vascular inventory for endangered or threatened species is appropriate if not imperative. **[Q2]**

Section 5.7 Flood Plains

Since the purpose of this project is to supply water, the pipeline and the intake will have to be constructed in the flood plain because there is no other feasible alternative. This will cause some disruption to the areas around the construction of the pipeline, but if the disturbed areas are reverted back to their natural state there should not be any long term effects. The route chosen for the pipeline would take it across numerous streams. It is at these points that it will be crucial for the construction of the pipeline to follow best management practices to minimize the impacts of the crossings. The pipelines will also have to be constructed in a way to make them able to withstand flood like conditions and to comply with the National Flood Insurance Act.

Alternative C would effect only small areas during construction, but without any major impacts. There would be no change in the climate or the general characteristics of the geology of the Duck River area. The effects upon the soils and the flood plain will be negligible. **[N1]**

Section 5.8 Terrestrial Life

Given the length of the proposed pipeline (13 miles), certain species could be affected either by directly disturbing habitat or through disturbance of foraging ability, nesting, etc. Attention to sensitive species (such as the Indiana Gray Bat) should be considered. **[Q1]** Most importantly to consider are habitat fragmentation effects associated with a pipeline right-of-way. This would have the potential to destroy underground nests/burrows of terrestrial species and potentially impact a species metapopulation. TVA should address potential impact areas for whatever terrestrial species are located there, and provide some attempt to relocate species that most likely affected by pipeline construction. Additionally, TVA should investigate the possibility of co-locating the proposed pipeline in existing right-of-ways. **[P1]**

Section 5.9 Endangered and Threatened Species

Considering endangered or otherwise protected vascular plant species of Tennessee, the DEIS methodology of determining the potential for a protected species to occur in any of the Upper Duck River Basin alternative project areas is unacceptable. Furthermore, simply stating the likelihood of a protected species occurring in an affected area as either 'yes' or 'no' is also unacceptable. For example, *Helianthus eggertii* occurs in nine (not eight) Tennessee counties (Chester, E W, Wofford, B E., and Robert Kral, 1997. *Atlas of Tennessee Vascular Plants'*. Volume 2 Angiosperms: Dicets Miscellaneous Publication Number 13. The Center for Field Biology, Austin Peay University. Clarksville, Tennessee. 238 pp.). This composite, as noted in the DEIS, occurs approximately twelve miles SW of Columbia in Maury County. As stated in the DEIS, *H. eggertii* is not known to occur in the Central Basin Physiographic Province of Tennessee. However, significant portions of Maury, Bedford, and Davidson Counties each with a site record of the composite subsequently occur in the Central Basin Physiographic Province (Chester), including the station at Maury County. This alone establishes that the protected plant is not associated exclusively with the Highland Rim Provinces (East and West). Six counties in the Eastern and Western Highland Rim Provinces support *H. eggertii* (Chester *et al.*, 1997), not including the station at Coffee County as stated in the DEIS. Three of the nine known and documented Tennessee stations of the composite are supported in the Central Basin Province contradictory to statements issued in the DEIS. **[Q11]**

Considering that three of the populations occur in the Highland Rim Province and more importantly three in the Central Basin Province, should not a complete vascular plant inventory be conducted before any alternative is implemented? Although surveys were conducted on Columbia Project Lands. their methodologies are poorly if at all delineated in the DEIS - merely stated as extensive surveys were conducted. Did the surveys intend to find only *H. eggertii* or *all* the states listed and federal species? How is an extensive survey defined? Complete vascular inventories should entail a systematic collection within all affected areas, not merely probable habitats. Sampling should run through two growing

seasons depending on the area and number of habitats and documentation of specimens (voucher specimens if applicable for protected species or even pictures) and their respective locations should all be obtainable by the public. Furthermore, extensive surveys are not tantamount to baseline inventories. Surely, a single voucher specimen for every vascular plant encountered was collected and identified in the Columbia Project Lands area. If not, how can the species probability or likelihood of occurrence be stated with any confidence? **[Q12]**

Lastly, *Schwalbea americana* and *Xyris tennesseensis* found in Coffee and Lewis Counties respectively are both considered not potentially affected or likely to occur in any of the alternative project areas These assumptions are based on an 1879 site record and an eight-mile separation from a proposed alternative project area. The issue here does not concern itself with tangible distances and uncommonly intermittent records, or even distributions amongst physiographic provinces of protected plants near probable affected areas. But simply how can statements in the DEIS be made concerning the potential or likelihood *of at least* sixty-eight protected species occurring in alternative areas without a complete baseline vascular plant inventories. **[Q7]**

Section 5.10 Land Use

Alternative C would only have short-term adverse effects on land use, primarily because the location and construction of the pipeline, intake, and booster station can be adjusted so as to minimize their effects on prime farmland and other uses of the land in the area. Due to its minimum requirements for land (estimated to be 2 acres plus 130 acres of easement for the pipeline), this alternative is preferred over Alternative B which would require the disturbance of 3,600 acres of land. **[R1]**

Section 5.11 Recreation

Alternative C would have only a minimum impact upon the recreational use of the Duck River - and for only a brief period of time Only a very small (< 1 acre) would be required for the intake structure Also, neither the presence nor operation of the underground pipeline would negatively impact the recreational use of this river. **[S1]**

Section 5.12 Cultural Resources

When compared with Alternative E (requiring a 20-mile-long pipeline), and Alternative B (requiring the disturbance of 3,600 acres), Alternative C would only disturb a small amount of Land Therefore, assuming that the potential cultural resources are evenly distributed, the Alternative C would have the least impact on any existing cultural resources. In addition, after the site/route is reviewed by the Tennessee State Historic Preservation Office, the pipeline construction could be adjusted to minimize further disturbance to cultural resources under this alternative. **[T1]**

Section 5.13 - 5.18

Alternative C has some unavoidable adverse impacts which include the construction of 13 miles of pipeline and localized short-term impacts on aquatic, terrestrial, and cultural resources. It also has some irreversible and irretrievable resource commitments to build the intakes, pumping stations, and pipelines. There will be long-term commitments of around 10 acres of land for the intake and pumping facilities, and short-term use of the land surface along the routes of the pipelines.

However. an alternative that we feel would best fit this project was not considered. This alternative is as follows:

Alternative Not Considered

Given the potential serious impacts on aquatic fauna in several proposed alternatives, TVA is strongly urged to completely disregard Alternative B and D, and consider the possibility of constructing an offshore reservoir Page 58 of the DEIS stated that

this alternative was "adequately represented by the Fountain Creek Reservoir alternative" . However, our proposed alternative represents an entirely different scope than a tributary reservoir. TVA should not consider these alternatives to be the same.

Given the number of federally listed aquatic species in the Duck River system, and the relatively common nature of many of the terrestrial plants and animals, it makes much more sense to limit impacts to an offshore site. Impacts with this sort of alternative would likely only affect plant communities in the area. Since TVA has purchased the rights to 3,800 acres of land within the Fountain Creek watershed, surely a parcel of land exists where few sensitive plant or animal communities exist, or where these effects would be minimal. This alternative would preserve the biotic integrity of the aquatic fauna of the Fountain Creek system (182 spp.).

Additionally, this alternative could adequately meet water supply needs if the containment reservoir was built to accommodate a large volume of water (ca. I billion gallons). Such a reservoir allowed to fill slowly would minimize cubic feet per second (cfs) removal effects if the water withdrawal area were around Duck River Mile 140-200. Furthermore, this alternative could allow construction of the reservoir near the river (within a few miles), therefore eliminating the need for a 10-20 mile pipeline.

TVA should strongly consider including this alternative in their potential revisions or attachments to the DEIS. **[A25]** Besides Alternative C and E, this alternative would pose the least threat to the aquatic fauna

Sincerely,

Graduate Students - Environmental Science
University of Tennessee at Chattanooga

Columbia Water Supply EIS Log Number 43
Justin P. Wilson, Deputy to the Governor of Tennessee

October 20, 2000

Ms. Linda Oxendine
Draft EIS-Upper Duck River Basin
400 West Summit Hill Drive, WT 8C
Knoxville, Tennessee 37902

Dear Ms. Oxendine:

As the Governor's Lead Contact for State of Tennessee, National Environmental Policy Act (NEPA) reviews, I am providing comments in response to the Draft Environmental Impact Statement (DEIS), Future Water Supply Needs in the Upper Duck River Basin, August 2000. The attached comments from state agencies represent the complete and official response of the State of Tennessee. Please give these comments your full consideration.

A variety of unresolved issues and unmet obligations remained after the closure of the Columbia Dam project. First and foremost of these is the need to resolve the long-term water supply needs of the Upper Duck River Basin. In **Governor Don Sundquist's view, clean and dependable water for the Columbia region is as fundamental to the economic growth of the region as is dependable, low-cost electricity. This is the State's overriding concern. [C1]**

As we stated in our letter dated March 7, 1997 concerning the closure of the Columbia project, "The TVA should verify existing public water supply sources or finance new supplies at levels that meet local long-range water supply needs as defined by the Regional Water Supply Analysis for Southern Williamson, Marshall and Maury Counties or by the State." We also stated, "Although local interests have shared responsibility to support water supplies, the larger burden to verify or produce dependable water supplies is TVA's alone." These assertions remain true.

TVA's water analysis seriously examines regional water supply needs. It is a responsible effort to meet your obligations to the people of the Upper Duck River region. **[A10]**

The draft identifies a variety of alternatives ranging from a traditional impoundment, pipeline options and a dam improvement alternative. A single alternative or combination of options can provide water well into the future.

One or more of the alternatives addressed by the EIS may provide a long-term and reliable source of water. **[A19]** The following summarizes our view of the alternatives evaluated.

- The Fountain Creek Dam Alternative is fraught with both opportunity and limitations. This alternative appears to provide an adequate water supply. The Columbia Dam land use EIS, associated deed restrictions and agency agreements provide for environmental mitigation. Other permit issues must be resolved before project approval. Moreover, reservoir's shallow nature creates challenges for water quality. In no event, however, should the Fountain Creek Dam alternative be abandoned until provisions have been made for an adequate water supply through 2050. **[E29]**

- Based on information provided by the EIS, the Tennessee Department of Environment and Conservation's Division of Water Supply states that the Tim's Ford pipeline alternative provides the highest quantity and quality water. This alternative may also provide benefits to other communities along its route who face increasing water needs. **[H2]**

- Raising Normandy Dam has additional benefits independent of the water needs identified in this study. **[G22]**

The assumptions and conclusions in this document would be more complete if they included additional information and assessment. State agencies have identified a variety of concerns that may add greater clarity to future decisions, The following should be incorporated into the final draft:

- We do not accept the premise in the Draft EIS that there will be no growth in "new large, water consuming industries." The Tennessee Department of Economic and Community Development believes that industrial growth will be critical to the future growth of the region. **[U1]**

- Additional consideration of low-flow impacts from implementation of Alternative C, the pipeline to downstream reaches of the Duck River, should be further evaluated and discussed. All impacts should be weighed and assessed to contrast each alternative fully. **[F15]**

- Broader benefits provided by the Normandy reservoir option to increase flow in the Duck River and the potential for mitigation measures to protect Short Springs Natural Area should be documented in the EIS. **[S2]**

- The Summary Comparison Table 6 on page 60 should also document a brief summary of natural and environmental impacts since environmental permit issues will be a major consideration in balancing benefits with impacts. **[A18]**

Although it is not a specific part of this analysis, we commended TVA for meeting another state criteria to resolve its obligations for water. The setting aside of locally derived trust funds for regional water supply projects represents sound judgment and necessary fairness. These funds can play a significant role in the funding of an alternative addressed in the EIS. **[B14]**

Ultimately, the decision to make a proposal to replace the water that would have been provided by the Columbia dam and to offer it for federal and state permits resides with the community. The TVA has acted responsibly and prudently to aid the community to make the necessary decisions. We commend your leadership and offer our assistance for a final resolution. **[B9]**

Sincerely,

Justin P. Wilson
Deputy to the Governor

Attachments

Columbia Water Supply EIS Log Number 51
U. S. Environmental Protection Agency

October 26, 2000

Dr. Linda Oxendine
Tennessee Valley Authority
400 West Summit Hill Drive, WT 8C
Knoxville, TN 37902

EPA NEPA Comments on TVA DEIS for the "Future Water Supply Needs in the Upper Duck River Basin;" Bedford, Marshall, Maury and Williamson Counties, Tennessee; CEQ No. 000315

Dear Dr. Oxendine:

Consistent with Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309(a) of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed thc referenced Tennessee Valley Authority (TVA) Draft Environmental Impact Statement (DEIS) on various future water supply alternatives for the area.

The purpose of the DEIS is to: 1) determine the need for additional water supply in the Duck River watershed over the next 50 years for Bedford, Marshall, Maury and southern Williamson County, 2) identification of ways to meet any determined water needs, and 3) environmental and societal impacts associated with those ways of meeting any water needs.

We offer the following comments for TVA's consideration in the development of the Final ElS (FEIS):

NEPA Process - As suggested on page 1, the EIS is written much like a programmatic EIS since it generically explores a need for additional water supplies and leaves site-specific plans for the future. For example, the reservoir management plan for the Fountain Creek Reservoir alternative (B) was not developed, the environmental impacts of the new water treatment plant for the downstream intake alternative (C) were not included in the impact analysis, and the pipeline impacts for Alternatives C, E and B were also not disclosed. Page 39 also states that "TVA is not proposing to design or construct any of these facilities" and "[i]n this EIS, these action alternatives have been generally described in light of their conceptual nature at this early stage." Page 1 further states that ".., several of the alternatives would not have to be built for a number of years." While EPA agrees with the concept and need for programmatic EISs that are followed by site-specific NEPA documents, our concern is that this EIS was not titled as a programmatic EIS. This should be discussed. **[A13]**

It should also be noted that if the present EIS is not a programmatic EIS but rather is an action EIS, construction of the preferred alternative would need to be initiated within five years or a re-evaluation of impacts would be needed, If impacts were determined at that time to be significantly different, a supplemental EIS would be needed if the project was pursued. **[A14]**

Consistent with the *Federal Register,* public comments are due to TVA by 10/30/00 as opposed to the 10/20/00 date stated on the DEIS cover page. Accordingly, we recommend that TVA receive comments postmarked by the 10/30/00 date. **[A17]**

Purpose & Need - Although there seems to be a perceived need by some of the locals (pg. 10) for additional water supplies in the watershed, the actual need seems unjustified at this time for the Bedford and Marshall County service area through 2050, based on the needs analysis in the *DEIS.* However, for the Maury and southern Williamson County service area, water supply is expected to become a growing issue after 2015. The DEIS indicates (pg. 31) that by 2025 the unmet need would be 6 cfs (4 mgd), by 2035 it would be 14 cfs (9 mgd), and by 2050 it would be 22 cfs (14 mgd) beyond the 40 cfs available from the Normandy Reservoir. However, page 35 notes that "[t]hese amounts of water would be needed only during extended drought conditions, when demand was at its maximum and nearly all of the flow in the river was supplied by the minimum discharge from Normandy Dam." **[C9]**

The DEIS analyses assume that no new water-consuming industries were to site in the watershed and increase the water demands. In addition, it is somewhat unclear *if agricultural* needs were adequately included. Page 24 of the DEIS states that "[t]he amount of water withdrawn for agricultural irrigation is not known, but given the intensive agricultural land use in the three county area, significant amounts could be drawn during an extended drought." Similarly, page 25 states that the USGS, in their 1996 needs evaluation estimates, "...did not include any water for new, self-supplied industries or major expansions of agricultural water use in any of the three water service areas." The FEIS should further discuss agricultural needs and the potential for agricultural expansion and additional water-consuming industries siting in the area. **[V3]**

Given the apparent minimal immediate need for additional source water, the intended purpose of the reservoir may be more to enhance real estate and recreational value in the area more so (or rather than) creation of additional source water. If so, the focus of the EIS should be environmental impacts on actions associated with increased urbanization and residential sprawl into rural areas. **[A12]**

• **Alternatives -** In addition to the No (federal) Action Alternative (A), four action alternatives were considered: Fountain Creek Reservoir (B), Downstream Water Intake (C), Raise Normandy Reservoir Pool (D*),* and the Tims Ford Reservoir Pipeline (E). Alternative A would involve no new water supply although improvements of existing systems would proceed; Alternative B would involve construction of a new multipurpose reservoir on Fountain Creek near the confluence with Duck River; Alternative C would involve construction of a new water intake on the Duck River downstream of the confluence with Catheys Creek and include an associated 13-mile long pipeline (with a booster station) to a new water treatment plant; Alternative D would raise the pool of the existing Normandy Reservoir to augment flows in Duck River; and Alternative E would involve construction of a water intake in nearby Tims Ford Reservoir and include an associated 20-mile long pipeline to the Duck River (with a booster station) to augment river flows when needed. Overall, these alternatives would increase additional water volumes from none (A), to 16 cfs (D), to 22 cfs (E), to 46 cfs (C), to 74 cfs (B) and would meet perceived water needs until 2015 (A), 2035 (D), 2050 (E), or beyond 2050 (B and C). The most significant land use changes would be via construction of the Fountain Creek Reservoir (B) involving the clearcutting of some 225 acres of forested wetlands and flooding 2,200 acres of land at normal full pool as well as the construction of a short 5-mile long pipeline. The next most disruptive alternative would be raising the pool of Normandy Reservoir (D) some five feet involving loss of shoreline vegetation (including forested wetlands) and existing shoreline recreational amenities. Finally, the significant pipeline constructions associated with the water intakes for Alternatives C (13-mile pipeline) and E (20-mile pipeline) could be disruptive if environmental features within the ROW corridor are unavoidable. The No Action Alternative would involve only minor construction unless the existing water treatment plant were expanded to capacity (30.8 mgd*),* which seems likely. All action alternatives would increase Duck River flows at some point along the river and therefore increase downstream

wetted areas and benefit associated aquatic species. These alternatives would also allow maintenance of the minimum 100 cfs flows (at RM 132.8) required for the river system according to the TDEC.

From a practical perspective, implementation of the Fountain Creek Reservoir would utilize some 2,800 acres of the available Columbia lands previously acquired for the discontinued Columbia Dam and Reservoir. Such use would keep these lands in public ownership and under the direct purview of TVA. However, an additional 800 acres of land currently not in public ownership would need to be acquired for the reservoir. **[A16]**

• **Preferred Alternative -** No preferred alternative was selected by TVA in the DEIS, although TVA has indicated a non-preference for the No Action Alternative (A). While acceptable from a NEPA perspective and understandable in the sense that TVA and its cooperators might want additional public input before selecting a preferred alternative, we note that delaying the identification of TVA's selection until the FEIS stage is *late* in the NEPA process. At that stage, the public and resource agencies would not be able to comment on the preferred alternative until the FEIS comment period, which may or may not truly influence any modification of the preferred alternative and would reduce the probability of a different alternative being selected if the public so-requested. **[A24]**

EPA is not convinced that a water supply alternative is needed at this time for the area of concern, particularly the Bedford and Marshall County service areas. In regard to Maury and southern Williamson County, we believe the determined unmet need during droughts starting in 2015 through 2025 (4 mgd or 6 cfs) could and should be met through water conservation. The 2035 unmet need (9 mgd or 14 cfs) could arguably also be met through conservation. The unreel need for 2050 (14 mgd or 22 cfs), however, is approximately 50% above the 40 csf baseline Normandy flows, and therefore would likely require additional water supply. However, that need is many years away and would only apply during drought situations. As such, based on the DEIS, EPA believes the need for additional water supply is unfounded for the Bedford and Marshall Counties and can be met by conservation methods for some time (through approximately 2025 or 2035) for the Maury and southern Williamson Counties during droughts. At this time, therefore, EPA favors the No Action Alternative (A) for the near term. We recognize, however, the value of early planning for future needs in order to determine an adequate and environmental approach to additional source water. **[C10]**

If this approach is unacceptable to local water authorities or if additional agricultural or water-consuming interests can be expected to withdraw significant additional volumes from the Duck River, EPA recommends that the most environmental alternative be implemented by approximately 2025. Voluntary conservation methods should be encouraged and employed regardless of which alternative is selected, with incentives and disincentives should be provided by local authorities for complying customers. Conservation should target those activities that consume water (e.g., lawn watering) as opposed to those that return a large portion of the water to its source (e.g., wastewater). **[A31]**

Of the four presented action alternatives (B-E), EPA does not environmentally favor the construction of Fountain Creek Reservoir. This is due to the projected substantial loss of forested wetlands and uplands, potential ground-water effects due to local karstic geology, the potential for shoreline development and its associated impacts on water quality, the expectation for a small nutrient-rich reservoir with a slow flushing rate which may result in noncompliance with water quality standards associated with eutrophication, the potential for aquatic ecology effects downstream of the proposed dam due to reduced flows, the need to acquire an additional 800 acres of land, the uncertainty of the undocumented impacts of the new water treatment plant and associated five-mile long pipeline, and the existence of two nearby reservoirs (Normandy and Tims Ford) which might be utilized. **[E24]**

Conversely, however, we recognize that the Fountain Creek Reservoir would apparently become part of the TVA system and would therefore be managed by TVA, which has demonstrated significant expertise and success in reservoir management. **[E32]**

To help further assess the potential success or problems associated with the reservoir alternative, we suggest that water quality monitoring data for the nearby Normandy Reservoir (which by now has aged or equilibrated as a reservoir) be provided in the FEIS for comparison, to the extent the two reservoirs are similar. We have also enclosed an EPA Region 4 checklist *(EPA Section 404 Reservoir Review)* prepared by our wetlands section that should provide additional guidance in assessing potential reservoir projects. **[K9]**

The impacts of the remaining action alternatives (C, D & E) are uncertain since impacts of pipeline routes C & E) and specifics on treatment plants common to all action alternatives are not disclosed. **[A29]** Alternative E also proposed interbasin transfer of water from Tims Ford Reservoir to Duck Creek, with which there also could be some associated environmental issues. **[H23]** We recommend that a modification of Alternative E (which we name here as *Modified E)* be considered to the extent that it might be feasible. Modified E relates to the Tullahoma Wastewater Treatment Plant (Tullahoma) discussed on pages 152-153. Tullahoma purchases water from the Duck River Utility Commission which withdraws from the Normandy Reservoir. Tullahoma then discharges its treated wastewater into Rock Creek which is a tributary of the Elk River, which is connected to and drains into the Tims Ford Reservoir. As such, water is being removed from the Duck River system and discharged into Tims Ford and, with Alternative E, Tims Ford water is being withdrawn and discharged into the Duck River. We suggest that the potential for Tullahoma returning its Duck River water to Duck River as Modified E be explored. This would avoid interbasin transfer and the Tims Ford 20-mile pipeline (albeit, the logistics and volumes of Modified E are unclear and the need for a pipeline of uncertain length from Tullahoma to the Duck River exists). **[K26]** Given these considerations, our alternatives "preference" from most preferred to least is as follows: *A, Modified E (if feasible), C, E, D and B.* **[A30]**

• **Water Conservation -** The document fails to discuss water conservation as an alternative or supplement to the action or no action alternatives. Efficient use of existing supplies can save money, obviate the need for additional water storage capacity, and prolong the use of existing supplies during shortages. Successful implementation of water conservation measures depends on regulatory action by state and local governments and management decisions by the local utility. Typical measures are codes and ordinances that mandate water conservation through the use of plumbing fixtures, use of reclaimed water, installation of meters, leak detection programs, rate structure changes, and public education programs. As previously indicated, voluntary conservation methods should be encouraged and employed regardless of the alternative selected, with incentives and disincentives provided by local authorities for complying customers. Conservation should target those activities that consume water (e.g., lawn watering) as opposed to those that return a large portion of the water to its source (e.g., wastewater). **[C22]**

• Water Quality

* *Surface Water* - Page 147 indicates that the Fountain Creek watershed that would contain the reservoir proposed under Alternative B "...contains relatively high levels of nitrogen and phosphorus from natural sources as well as non-point sources." This page further states that "[t]hese levels of nutrients would be quite likely to support excessive algal growth in the upper layers of the reservoir." Page 149 similarly states that "...construction and use of the Fountain Creek water supply reservoir would create a relatively small, nutrient-rich reservoir which probably would have to be carefully monitored and the watershed strictly managed to protect the quality of the source water." Accordingly, EPA is concerned that the Fountain Creek Reservoir proposed under B could become eutrophic and not comply with the Clean Water Act. **[E23]**

As further discussed below under *Water Supply,* sediments and disinfection-by-products (THMs) have been a significant issue for the public water supply system currently using the Duck River as its source water. The source, effects and control of THMs should be discussed in the FEIS. **[K3]**

* *Ground Water* - The project area is generally karstic and as such has sinkholes and other natural conduits to the water table. Construction of a reservoir in these areas could promote contamination of ground water if the reservoir water quality and sediment quality becomes degraded and migrate into the water table. The DEIS mentions (pg. 142) the potential for grouting the bottom of the reservoir area during construction to prevent such interconnection. Special engineering methods would be needed in these karstic areas, particularly those involving excavation, low elevations, caves, and similar geologic features. The greatest potential for ground water impacts among the alternatives appears to be the construction of the reservoir. **[J1]**

· **Wetlands -** The greatest wetland losses are associated with B (reservoir) and D (raising Normandy pool). As previously indicated, B would result in the loss of some 225 acres of forested wetlands as well as the loss of the reach of Fountain Creek that would be inundated. It is unclear if perhaps other non-forested wetlands may also be lost within the 2,200 acres to be inundated for the reservoir (the FEIS should therefore total all the estimated jurisdictional wetlands that would be inundated by the reservoir). It should be noted that EPA considers both vegetated wetlands and creek water as wetlands, and water inundation of the reservoir wetlands and creek water is considered the same as filling wetlands with soil. **[M2]**

The 225 acres of wetlands were not precisely determined in the field but were estimated by aerial false-color infra-red photography. A jurisdictional determination of these wetland habitats needs to be made pursuant to Section 404/U.S. Army Corps of Engineer regulations. Following this determination, an avoidance or mitigation strategy should be provided. The mitigation strategies (pg. 163) indicated in the DEIS were general in nature and should be refined to indicate a more specific mitigation plan. Although not required, a draft mitigation plan should be included in the FEIS as well as a commitment to provide wetland compensation to the satisfaction of the resource agencies. **[M3]**

Implementation of Alternative D, which would raise the elevation of Normandy Reservoir by five feet, would result in the inundation of riparian vegetation including "...several forested wetlands that now occur at the upstream ends of some reservoir embayments" (pg. 164) as well as herbaceous fringe wetlands along the current Normandy shoreline. It is unclear what wetland losses or conversions may be associated with the pipeline alternatives C and E). The FEIS should be more specific as to the kind, quality and function of the wetlands that would be lost for each alternative. **[M4]**

Consistent with 404 (b)(l) guidelines, the loss of wetlands associated with B and D would need to be considered in the alternatives analysis, especially since other practicable alternatives with less wetland impacts exist. **[M5]**

· **Geotechnical and Soils -** EPA is concerned over the apparent lack of geotechnical studies in the document to determine the suitability of the site soils to hold water relative to the reservoir alternative (B). Local soils should ideally be relatively impermeable in order to retain desired water levels without creating zones of saturated soils adjacent to the project. Leakage and erosion of the proposed earthen dam are also a concern. The FEIS should contain estimates of impacts of water loss through the permeable parent soil materials that will make up the basin of the proposed reservoir. **[I1]**

· **Water Supply -** We offer the following comments and general questions regarding water supply:

* *Classified Uses:* We note from page 82 that: "The domestic water supply use classification is excluded in these areas because the State of Tennessee (TDEC) considers stream reaches immediately downstream from municipal wastewater discharges to be unsuitable for domestic water supply withdrawal." The state's criteria and scientific basis for this decision is unclear. How does TDEC determine where such an exclusion zone should no longer exist? Although not a TVA decision, we would appreciate some discussion on this matter in the FEIS. **[K2]**

* *Water Supply Designated Use* - Similarly, it is also unclear what criteria TDEC uses to determine that one stream segment is suitable for an industrial water supply designated use, and not for a municipal water supply designated use. **[K1]**

* *Source Water Protection* - As suggested above, sediments and disinfection-by-products (THMs) have been a significant issue for the public water supply system currently using the Duck River as its source water. THM precursors include algae and high Total Organic Carbon (TOC) levels, which are in turn related to elevated nutrients. We strongly recommend a TVA commitment for source water protection as part of the preferred alternative in the FEIS. We believe such protection should be part and parcel of any potential approval of a water supply project **[K4]** (also see below discussion under *Basin Management Plan* which includes the referenced *Randleman Watershed Management Rules,* as well as item #6.k. under the enclosed *EPA Section 404 Reservoir Review).*

* *Minimum Flows* - All minimum flows downstream of the proposed dam for Alternative B *should be consistent with the U.S. Fish and Wildlife (FWS) and EPA guidelines that include* minimum flow rates and variable flows consistent with sustainability requirements for fish and other aquatic inhabitants. **[L2]**

• **Basin Management** -The disposition, ownership, and management of the environs surrounding the reservoir proposal (B) are a major shortcoming of the DEIS. As other reservoir projects in the nation have experienced, control of nutrients in the reservoirs and lakes in the southern U.S. are a continuing challenge. Shallow, warm water bodies enriched with nutrients from farmland and agricultural runoff and natural sources quickly become colonized with mats of aquatic plants and algae. To control nutrient enrichment and Eutrophication, the drainage basin containing the reservoir will likely require management measures and land use controls including but not limited to: creation of buffer zones in perennial and intermittent streams in the watershed; timber cutting and agricultural use restrictions in buffer zones; lot size and housing density restrictions; policies on septic tank placement and maintenance, and other strategies to prevent pollutants and nutrients from entering the proposed reservoir. If Alternative B is selected by TVA as its preferred alternative, the FEIS should provide at least a draft basin management plan that includes TVA policies and procedures on shoreline management, water quality, monitoring, aquatic weed control, fisheries, etc. as they relate to the proposed Fountain Creek Reservoir.

As an example of reservoir management techniques that may be useful in addition to TVA's management EISs such as the recent *Shoreline Management EIS,* we have enclosed the watershed management rules that the State of North Carolina required for the Lake Randleman watershed *(Randleman Watershed Management Rules)* in 1998. **[R4]**

• **Fisheries** - As is typical for a reservoir project that impounds a stream reach, the biodiversity of the inundated stream would decrease as the system changes from a lotic to a lentic system, although the numbers of the remaining species would likely increase. For the reservoir alternative (B), the DEIS (pg. 156) indicates that the182+ species in Cane Creek are expected to be reduced to the 44+ to 48+ species living in nearby Normandy Reservoir.

• **Endangered Species -** Given the fact that endangered mussels caused the Columbia Dam to be discontinued, TVA should ensure that no such endangered species or other unresolvable "show-stoppers" exist in the nearby Fountain Creek watershed if the reservoir alternative (B) is pursued. **[Q6]**

• **Environmental Justice (E J) -** We note that the EJ Executive Order (EO 12898) was not listed on pages 16-17 under *Other Review and Permit Processes.* The FEIS should list it and, more importantly, consider potential EJ impacts relative to the alternatives. **[V1]**

Page 137 discusses demographics of the project area. It appears that minority and low-income percentages are similar among project counties and lower than the state average. One exception is the Bethesda Division of Williamson County for low-income groups, which is noticeable greater (12.6%) than that of the total county (5.8%). This should be considered during infrastructure construction of the alternative. However, since the overall effect of the project would be to increase water supply in these counties, this may or may not be a great EJ concern. **[V2]**

• **Cumulative/Secondary Impacts** -The relocation of Highway 50, any secondary roads, power transmission lines, water treatment plants and other related facilities of the presented alternatives, as well as other present, proposed and foreseeable future projects over a 10- to 20-year horizon in the region, should be considered and discussed in the FEIS. **[A28]**

· **Summary** - In summary, until a true water need can be demonstrated beyond what existing sources (Normandy flows and wastewater returns) and conservation methods can provide, EPA favors the No Action (A) for the near future. If this is considered unacceptable to local water authorities and implementation of one of the remaining alternatives (B-E) is pursued, we would not prefer implementation of the Fountain Creek Reservoir (B) or raising the pool of the Normandy Reservoir (D) due to their impacts. We also have environmental concerns about the alternatives with long pipelines (C and E) with unclear routes and undisclosed impacts. If the pipeline impacts could be minimized through alignment shifts and the impacts of new water treatment plants common to all action alternatives could also be minimized, we would favor C over E since it has a shorter pipeline than E, and E also involves interbasin transfer. However, we strongly suggest that the feasibility of a modification of E (Modified E) be considered, which returns additional wastewater to the Duck River as opposed to transferring it to the Tims Ford Reservoir. **[A32]**

• **EPA DEIS Rating -** Since no preferred alternative was selected, EPA has rated all alternatives individually. As previously indicated, our alternatives "preference" from most preferred to least is as follows: *A, Modified E (if feasible), C, E, D and B.*

We rate A as "LO" *(Lack of Objections)* due to the minimal environmental disruption and the acceptability of the water supply volumes for the near term, especially if water conservation methods are implemented in Maury and southern Williamson Counties during droughts. We rate Modified E, C and E as "EC-2" *(Environmental Concerns,* with additional information requested) due to the uncertain feasibility and impacts of Modified E, and the long pipelines of C and E plus the additional interbasin transfer aspect associated with E. We rate D and B as "EO-2" *(Environmental Objections,* with additional information requested) due to land use impacts such as loss of forested wetlands for B and loss of shoreline vegetation (including forested wetlands) and shoreline amenities for D. Overall, we also rate the DEIS as "EO-2" since two of the alternatives are rated "EO-2".

We were pleased to provide these comments. Should you have questions, feel free to contact Chris Hoberg of my staff at 404/562-9619.

Sincerely,

Heinz J. Mueller, Chief
Office of Environmental Assessment Environmental Accountability Division

Enclosures

Columbia Water Supply EIS Log Number 64
Andrew N. Barrass, Natural Heritage, Tennessee Department of Environment and Conservation

October 20, 2000

Ms. Linda B. Oxendine
Tennessee Valley Authority
400 West Summit Hill Drive
WT 8C
Knoxville TN 37902

Subject: Project review information for rare, threatened, or endangered species and critical or sensitive habitat; Draft Environmental Impact Statement, Future Water Supply Needs Upper Duck River Basin, Tennessee Valley Authority

Dear Ms. Oxendine:

As a part of our review of the subject **Draft Environmental Impact Statement** *(Draft ELS),* please be advised that we have reviewed our Departmental data bases and find recorded State and/or Federally listed species, within a one mile radius of the proposed Tennessee Valley Authority (TVA) project boundaries and within a one mile radius of the proposed managed lands (project alternatives). These species have very specific or rare habitat. Our records also indicate additional species occurrence records, sensitive ecological sites, and management areas, within an approximate four mile radius of the proposed project site(s). Your agency is aware of these records and we suggest that these records be further evaluated in cooperation with your Heritage Program in Norris, TN. **[Q3]**

Our Division reviewed the subject document and we offer these general comments as part of our review:

General comments;

In order to comply with the National Environmental Policy Act consideration should be given to the comprehensive and *cumulative* impacts associated with the project actions. Considering the information provided, it is probable that any proposed pipeline development will increase stream crossings, will affect instream, aquatic, and riparian habitat, and thereby significantly degrading habitat as part of proposed construction implementation. The TVA has not identified restoration nor reclamation actions to lessen any construction-related impacts, e.g., best management practices or bioengineering techniques. **[A27]**

We strongly support a *no-net-loss* (similar to our Tennessee Wetland Conservation Strategy and the wetland protection initiative) approach to the management of public lands and our State natural resources. Although TVA outlines some protection of natural resources as part of the description of the proposed Alternatives, these are not specific and do not address long term protection of natural resources, specific sensitive *habitat* and species *throughout* the planning corridor. **[A26]**

We also offer these specific comments related to the *Draft ElS* document and proposed Alternatives or management strategy of Federal lands and water supply.

Specific comments;

Alternative B proposes the construction of a reservoir on Fountain Creek. The Fountain Creek reservoir does not appear to be a viable alternative in light of the estimated cost and potential for eutrophication caused by the nutrient rich Fountain Creek basin. Both TVA and the Tennessee Department of Agriculture have identified many nonpoint source water pollution issues throughout the watershed. These water pollution issues could have long-term impacts on the biodiversity of the area, particularly aquatic species. Correction of these problems is not a documented cost nor included in the discussion of impacts of this proposed alternative. **[K13]**

Although not documented in the *Draft ElS,* there are numerous rare, threatened or endangered aquatic species records at the mouth of Fountain Creek and immediately downstream in the Duck River. Assuming suitable habitat exists within Fountain Creek, these species could be present in the watershed e.g., Coppercheek Darter *(Etheostoma aqua#)* and Slabside Pearlymussel *(Lexingtonia dolabelloides).* **[Q17]**

Also, this alternative would inundate known populations of a number of rare plant species and could impact several registered State Natural Areas. The Glade cress *(Leavenworthia exigua var. exigua),* Tennessee milk-vetch *(Astragalus tennesseensis),* and Limestone fame-flower *(Talinum calcaricum) are* Tennessee special concern plants, which occur in the area of proposed inundation by a reservoir on Fountain Creek. These limestone cedar glade plants, that are globally rare and the plant communities (habitat), would be destroyed by inundation. **[Q13]**

The Water stitchwort *(Arenaria fontinalis)* is a Tennessee threatened and obligate wetland plant *(OBI.). The Water stitchwort occurs in* seepages *and other wet* areas a/ong *creeks. The OBL* plant would not survive prolonged inundation. The Duck river bladderpod *(Lesquerella densipila)* is a Tennessee threatened and globally rare plant, which also occurs in the area ora proposed reservoir on Fountain Creek. Field surveys conducted in the spring of this year by the Division of Natural Heritage staff have documented serious declines in populations of this plant in the majority of its range. Several bottomland areas adjoining Silver Creek continue to support populations of this plant. *These populations would be inundated under the Drafi ElS,* Alternative B. **[Q8]**

It is important to note that the Division of Natural Heritage staff did not survey the area south of State Route 50 on Fountain Creek in the spring of this year for the *Duck* River *bladderpod. This* area could also support populations of the protected plant species (potentially inundated by the proposed Fountain Creek reservoir). **[Q9]**

A population of the Tennessee and Federally listed (endangered) Leafy prairie-clover *(Dalea foliosa)* occurs between 620 feet and 630 feet elevation in the Moore Lane Glade Registered State Natural Area. This area is outside of the Fountain Creek watershed, but would require protection from inundation (629-foot elevation) by the two proposed extension (saddle) dam structures west of the proposed Fountain Creek reservoir. **[Q14]**

The information presented indicates that the Moore Lane Glade Registered State Natural Area (west of State Route 50) will be directly affected by the proposed location of the dam and construction area. A raised water table resulting from the impoundment could effect stream flow throughout the proposed project area. Due to the karst features of the area, a small, unnamed tributary to the Duck River (within the Natural Area) could have increased flow from ground water *inflow. It is not clear how this change in hydrology would affect the Leafy* prairie clover populations, which occur within the Natural Area. **[Q15]**

The proposed Alternative C would construct a water supply intake at a point downstream from Columbia in the Duck River and downstream from Cathy's Creek. The *Draft ElS* outlines suggested short-term impacts to ground water, surface water, aquatic life, terrestrial life, endangered species, etc. The document fails to identify the probable impacts of the proposed construction and water withdrawal. Although the document discusses the withdrawal of approximately a fifth of the maximum flow, the document does not acknowledge the potential impacts to reduced flow as seen during the most recent drought and low flow conditions (summer flow gauge records for 1998-2000). **[L5]**

Under Alternative D, the suggested maximum pool of Normandy Lake would be raised from 875 feet to 880 feet. Alternative D would flood portions of Short Springs Designated State Natural Area along Bobo Creek at contours below 880 feet during the normal maximum pool elevation of the reservoir. The bottom-land habitat receives seasonal inundation. By raising the lake level there would be prolonged periods of occasional inundation as well as longer periods of more permanent flooding of the habitat. We would expect this habitat and associated biological diversity to change community type and floristic composition along with the associated forest habitat. The forest type is a high quality mesic area with rich displays of spring wildflowers along Normandy Lake between the 875 and 880-foot contours. These areas could be impacted by inundation under Alternative D and could significantly impact the natural area through the destruction of the flora and fauna depending upon the timing and duration of inundation. This impact is cited in table 7 on page 63; however, it is not mentioned in the impacts described under Alternative D pages 48 - 56. The environmental impact of flooding the bottomland riparian forest could be a violation of Natural Resources Areas Rules, {TCA Section, 0400-2-8-.08 Intrusions, 0400-2-8-.22 Water Level Control} and may require additional Departmental permits for wetland impacts. **[G21]**

In addition, there are a number of Tennessee endangered, threatened and special concern plants which occur on lands above the 900 foot contour, around Normandy Lake at sites known as Rutledge Falls, Copperas Branch, and Short Springs Designated State Natural Area. The Division of Natural Heritage has no records of Tennessee endangered, threatened or special concern plants below the 900-foot contour of Normandy Lake. **[Q16]**

A change in water flow rates (downstream) or significant water withdrawals from the reservoir could affect two rare plants that occur in the Duck River. These are Water stitchwort *(Arenaria fontinalis)* a Tennessee threatened and obligate wetland plant (OBL), and Limestone blue star *(Amsonia tabernaemontana var. gattingeri),* a Tennessee special concern listed species and a facultative wetland plant. Comparing these two rare species, the Water stitchwort is more dependent on water (an obligate wetland plant) and would be sensitive to changes in hydrology (reduced seepage and flow rates). Occurrences of both species are found in the Duck River watershed, both above and below the confluence of Fountain Creek. It is unclear how the rare plant populations in the Duck River would be affected under the different alternatives, however the increased minimum flow under Alternative D could be beneficial to these rare species. **[Q10]**

An increase in shoreline erosion associated with additional access to Federal lands, encouraged by the proposed raising of water levels, could result directly in an increase in water pollution (especially sedimentation). The *Draft EIS* does not provide documentation for adequate protection of natural resources that could result in net losses of the State's biological and natural resources as well as increases in shoreline erosion. Perhaps TVA could suggest shoreline management strategies that would be implemented to protect natural resources and biodiversity if this alternative were selected. **[G23]**

Additionally, the proposed Alternative D could increase shoreline erosion, decrease water quality, reduce aquatic habitat, manipulate and significantly reduce forested and riparian

habitat, and reduce contiguous forested tracts (communities) simply as a result of prolonged inundation by sustained higher lake levels. We suggest that TVA fully document these losses and compare them to anticipated habitat improvements associated with increasing the lake shoreline area by raising the lake levels.

Managed shorelines, with increased efforts toward restoring habitat (particularly by erosion control through bioengineering techniques), are paramount to long term water quality improvements and protection of the State's rare, threatened or endangered species. By utilizing specific reservoir-wide management strategies throughout Normandy Lake TVA could demonstrate habitat improvements associated by raising the lake levels with increasing the lake shoreline area. Additional documentation is needed to outline steps that will be taken by TVA to protect the current *recreational* uses and diverse habitat along the shoreline. **[G24]**

Alternative E proposes to transfer water from Tims Ford reservoir to a downstream site through a 20-mile pipeline and booster pumping station to the lower Duck River. The transfer of large volumes of water between watersheds (inter-basin) could result in artificial range extensions for aquatic species or increase the likelihood that exotic species could invade these watersheds e.g., zebra mussels. The *Draft ElS* does not consider these potential impacts. The long-term impact by minor but continued drawdowns is not fully addressed considering the reduction of water from Tims Ford reservoir as part of this proposal. The *Draft ElS* does not consider aquatic biodiversity impacts in the reservoir resultant from sustained water withdrawals during drought conditions. **[L7]**

Our Department has worked with TVA staff for many years to develop policy and procedures in order to protect large undeveloped tracts of Federal lands. The purpose of this protection is to prolong significant habitat and biodiversity, especially for those species that utilize shorelines.

In conclusion, the document clearly illustrates many *significant* environmental impacts associated with the proposed Alternative B. Alternatives that lessen environmental impacts have been defined and documented in Alternatives C and E. The TVA acknowledges potential environmental impacts should Alternative D be implemented, including flooding portions of the Short Springs Designated State Natural Area.

In summary, considering the Alternatives presented, we find Alternatives C and E least objectionable and these alternatives clearly present minimal environmental impacts when compared to other alternatives presented. We have concerns about the management of shoreline tracts (Alternative D) and decreased stream flows that could result from Alternative C. We suggest that these impacts be further addressed and documented in the Final *ElS* as well as the methods for avoiding impacts associated with implementing these Alternatives. **[A33]**

We appreciate the opportunity to assist you with your pre-project planning. Please contact me if we can be of further assistance with this project or provide additional information. Our office is in Nashville, telephone 615/532-0431.

Respectfully

Andrew N. Barrass, Ph.D.
Environmental Review Coordinator,
Division of Natural Heritage
Department of Environment and Conservation

Columbia Water Supply EIS Log Number 58
Marty Marina, Tennessee Conservation League

Ms. Linda B. Oxendine, Project Manager
Draft EIS - Upper Duck River Basin
Tennessee Valley Authority
400 West Summit Hill Drive, WT 8C
Knoxville, TN 37902

Reference: Water Supply Duck River Basin

Dear Linda:

Thank you for the opportunity to comment on alternatives for addressing future water supply needs of the Upper Duck River Basin. The League has investigated the choices and believes raising Normandy Dam to be the optimal choice. **[G2, part]** Let me explain by first addressing our global concerns, then speaking to each solution.

We recognize that this EIS -- like the TERDA EIS -- is burdened with years (and generations) of expectations, disappointment, and frustration. In this case it was created by the anticipated completion of the Columbia Dam and its subsequent abandonment. Fortunately, the final EIS can benefit from improvements in conservation science and the science of water (supply and quality) management gained through the intervening decades. It is imperative that decisions in the final EIS also anticipate ethical considerations in preventing and managing present and future social conflicts over natural resources on the Duck. **[A40]** For instance,

The draft EIS is geared to providing enough water for Columbia to grow at the present rate for the next 50 years. We believe the present rate was not anticipated when the dam was originally projected and cannot be sustained for so long a period. Further, planning for it (or failing to recognize this) will eventually negatively impact Colombians' quality of life and the economic viability of other counties in the watershed. Atlanta could serve as a poster child for unbridled development. **[H4]**

The draft EIS addresses anticipated water demand without considering the impacts of low flow scenarios - similar to those presently being experienced - on maintaining river function. TVA's experience this summer in managing the water supply for Chattanooga and northeast Tennessee speaks to what happens when God does not provide enough rain to create adequate runoff. **[C15]**

The draft EIS does not address cumulative impacts of projected development on water quality or the water supply needed to clean the anticipated Total Maximum Daily Load (TMDL) created by development. Failures to address this issue can be found among the many streams listed on the Tennessee Department of Environment and Conservation's 303D list. **[K5]**

A. Using the present resources is an untenable solution because the system is presently functioning near its limits. **[D5]**

B. Building Fountain Creek Reservoir is an expensive alternative, reminiscent of choices made in the '60s and '70s. TVA and its stakeholders will do well to learn from previous experience and save itself and the taxpayer's dollars by choosing another scenario. This area of Fountain Creek is not suited to a reservoir because of the shallow water depth. As noted in the draft EIS, the Fountain Creek Reservoir will be a shallow, nutrient rich reservoir. By definition, we believe it will provide a poor water supply and poor aquatic

habitat. It also has a potential for creating more public expectation and suffering the same sociological conflicts over resources presently experienced on TVA's Nickajack, Chickamauga and Guntersville reservoirs. These were unintended consequences in those areas. Neither TVA, the state or county governments can afford the cost of managing the natural resource conflicts and it would be inexcusable to knowingly create them. Further, building the reservoir will cause biological loss and maintaining it under low dissolved oxygen and low flow circumstances will likely to continue this trend. **[E27]** (See TWRA and TDEC statements).

C. Taking water from downstream of the Columbia discharge needs more information before it can be a viable choice. This EIS does not consider construction or low-flow impacts to ground water, surface water, aquatic life, terrestrial life, or endangered species. Further it does not address consequences to the supply or biological life from continuously recycling water so close to the outflow pipe. What will be the attendant cost of wastewater and freshwater treatment or biological loss? **[F17]**

D. Raising the Normandy pool level has a moderate cost and the best chance of answering short and mid-term supply, with minimal biological or sociological impacts. While there will be some short-term loss, this alternative seems to accommodate management of the State Natural Area for its intended purpose and other habitat concerns at the reservoir. It will also improve present habitat conditions on the Duck. **[G3]**

E. Building a pipeline from the Tims Ford Reservoir to the Duck River will unnaturally favor a county outside the Tims Ford Reservoir and handicap counties within they reservoir as they struggle to meet their existing and current demands for clean and plentiful water. There will also be negative impacts to flora and fauna as the pipeline is constructed and maintained over the years. **[H18]**

Again, thank you for soliciting and considering the League's comments. Please know that we also wholeheartedly endorse comments made by TWRA and TDEC's Natural Heritage Division. As usual, we look forward to supporting TVA in creating a well-balanced solution to this issue. **[G2, part]**

Sincerely,

Marty Marina
Executive Director
Tennessee Conservation League

Columbia Water Supply EIS Log Number 72
Wayne Romesberg
(from Transcript of Public Meeting)

First thing I would like to say this is a local issue and it should be solved by the local people. We don't need environmental groups from California (western states) and we don't need environmental organizations in the southeast to help solve our problems and we definitely don't need another attorney from Murphreesboro to try to solve our problem. We know what happened last time there besides him getting rich. I think anyone here tonight needs to speak, state who they are, where they live, and if they represent any organizations. **[B10]** I am Wayne Romesberg; I am with the Murray County Commission. I am basically a life-long resident of Columbia.

Going to the alternatives, on Alternative A, the alternative of doing nothing, to me that is not an answer, so we should not even consider that. **[D3]** Going to Alternative C, Alternative C is Cathy's Creek Pumping Station, I don't believe this is an acceptable alternative because I don't know about you all but I don't think the idea of drinking my own sewer water is acceptable and I understand the people in California have been doing that for years and we see some of the problems they have. **[F19]**

The Alternative D, raising Normandy, this may be semi-acceptable but it is definitely better for the upper reaches of the Duck River Agency and for the lower regions like Marshall, Murray, Hickman, Humphreys, that in the long run probably will not help solve us as well as they just said. We still have to do water conservation in 2035 so basically that means our children will have to be back in 2035 to try to find another answer that we didn't solve. **[C12]**

[T]he pumping station from Tims Ford, I don't believe that's good. I do not like the idea of taking water from one river valley, pumping it to another river valley. It sets a precedent. What could happen in the future there, if someone wants to come into the Duck River valley, take water out of the Duck River valley, say pump it into the Harpeth River valley, or maybe even go back to the Elk. That's entirely possible. If we take this action, then we are setting a precedent. I don't believe this is good, **[H27]** which leaves only one alternative, which is B.

I would like to say one thing here before I get to B. We do need to consider something for the long range. I don't want to say nothing about people in the past; but if in the 60's, if we'd had leadership (and I don't mean local leadership), our local leadership wanted the Columbia Dam, but if we had leadership up higher, especially in Washington, who had some backbone to stand up to some environmentalists, we wouldn't be here discussing this today. The option I am looking for is for our children and the next generation not to have to come back to this auditorium or one similar to it where they are going to have to discuss thing - what are going to have to do about water. We have our chance now to solve the water for a long range and we need to have the backbone to do it **[A39]**

So the solution I see is B, is Fountain Creek Dam. Granted it is more expensive but sometimes you do have to bite the bullet to solve a problem and this is the bullet. **[E7, part]** Some notes I was also taking as we were discussing these, the average depth would only be 19 feet. I don't know about you but I see a few sportsmen out here, 19 feet would be some pretty good fishing, especially for some Crappie and Brim and that's what I enjoy fishing for. We didn't talk about the recreational uses. There will be recreational uses for Fountain Creek. **[E37]**

Also, one thing I notice that was said, the $50M, the approximate $50M cost, it was also put in that could be plus or minus 30%. Well that means if we watch our construction cost, this dam could be completed for as little as $35M if we pinch pennies. If we don't pinch pennies, it could $65M, and I also noticed when we talked about the pipelines, we never did say if that was going to be plus or minus 30%, Being that it was not said, I am going to assume that it wasn't so when we are looking at possibly a $35M versus some of these $11M and $18M alternatives, hey we are in the neighborhood. **[E39]**

One thing I would like to say is to finish up, and Dan it is not your fault. but people in Murray County still have a sour taste about TVA. I know you had the project dumped in your lap and it's not your fault but there are a lot of people that still have a sour taste about the Columbia Dam fiasco, and that's what it was - a fiasco. It should have never happened, but it did. **[B2]**

But in the long haul, I do feel like Alternative B, the Fountain Creek, is our best alternative for us, our children, and generations to come. **[E7, part]** If we do decide to go with Alternative B, what we need to do is make a solid commitment behind it, no bailing out from pressures of any group; and if, I don't know if TVA will even have anything to do with it, but if they do I would like to make sure that TVA does fight for Fountain Creek like they did fight for Tellico years ago because when they fought for Tellico, they won all the way to the Supreme Court. **[E40]** I would like to thank you for your time.

Wayne Romesberg

A. General and EIS Process

A1. [W]*e want to express appreciation to TVA and cooperating agencies for the opportunity to participate in this review and input process.* **John R. Collier, Jr., Chairman, Board of Public Utilities of Columbia, Tennessee, 53c**

A2. *We concur with the TVA's assessment and forward-thinking approach to the water supply in middle Tennessee.* **Frank M. Tamberrino. President, Maury Alliance, 66b**

A3. *Thank you for a good report unaffected by political restraints. We continue to need your advise and experience as we do our planning.* **Charles Sanders, 15b**

A4. *I would like to commend the authors of this draft project report on their thoroughness in developing the data that outlines the project options.* **Richard E. Lockwood, 31a**

A5. *I have followed this through from the beginning since they got rid of the Columbia Dam issue. I first want to thank Dan Ferry and TVA. They have done a great job; they've done the best they could; I know they've taken a lot of hard hits but I appreciate all the work they've done and all the effort that's gone into it.* **Sharon Vaughn, 79a**

A6. *We appreciate your willingness to accept comments and to travel to Columbia. TVA has been a good utility and good corporate citizen for many years, and we look forward to our continued partnership for the betterment of this community, the middle Tennessee region and the State of Tennessee.* **Frank M. Tamberrino. President, Maury Alliance, 66c**

A7. *The . . . . Draft EIS captures the biological data that exists for the Duck River region, while effectively outlining the scope of the potential impacts of each action alternative. The Nature Conservancy believes this is a thorough preliminary review that can be utilized to evaluate the important environmental and socioeconomic issues that must be addressed.* **Leslie Colley, The Nature Conservancy of Tennessee, 44a**

Response to Comments A1 - A7: Comments noted. TVA appreciates your willingness to participate in reviews such as this and your openness to new ideas.

A8. *On behalf of the* [Tennessee Duck River Development] *Agency, I want to express my appreciation to TVA and the other cooperating agencies for their leadership and contributions to this draft of the future water supply needs in the Upper Duck River Basin (or water supply EIS) and for the opportunity to participate in the process. This document is an important milestone on our path towards developing additional water supply to meet the anticipated needs of the region. Our Board believes TVA has accomplished the stated goals of the EIS. It has evaluated the need for water in the Upper Duck River watershed, identified potential ways to meet the identified need, and evaluated the environmental and socioeconomic impacts of several possible ways to meet those needs.* **Linda Nannie, Chairman Duck River Agency, 20a and 71a**

A9. *The EIS document has accomplished the stated goals. It has evaluated the need for water in the Upper Duck River watershed, identified potential ways to meet*

and identify needs, and evaluated the environmental and socioeconomic impacts of several possible ways to meet those needs. It its very important to us, as a water utility serving customers in Lewisburg and Marshall County, that this document has established an outline of the environmental issues and concerns that must be addressed in the development of the alternatives and the ultimate selection and completion of a project solution without prematurely limiting alternatives. **Larry E. Jones, 1a**

A10. *As we stated in our letter dated March 7, 1997 concerning the closure of the Columbia project, "The TVA should verify existing public water supply sources or finance new supplies at levels that meet local long-range water supply needs as defined by the Regional Water Supply Analysis for Southern Williamson, Marshall and Maury Counties or by the State." We also stated, "Although local interests have shared responsibility to support water supplies, the larger burden to verify or produce dependable water supplies is TVA's alone." These assertions remain true. TVA's water analysis seriously examines regional water supply needs. It is a responsible effort to meet your obligations to the people of the Upper Duck River region.* **Justin P. Wilson, Deputy to the Governor,43b**

A11. *Tennessee Citizens for Wilderness Planning commends TVA and its four cooperating agencies for their professional and thorough effort in producing the DEIS. The document has three related purposes:*

(a) Evaluation of water-supply needs through the year 2050. Demands above 40 cfs (which can be supplied by the existing Normandy Reservoir plus return flows from wastewater plants) are increasingly likely to occur after the year 2015. The alternatives that have been developed in the DE1S are based on supplying an additional 22 cfs.

(b) Identification of potential ways to meet the water needs; no preferred alternative has been selected in the DEIS.

(c) Evaluation of the environmental and socio-economic impacts of the identified alternative.

Liane B. Russell, for the Tennessee Citizens for Wilderness Planning Board of Directors, 30a

Response to Comments A8 - A11: Comments noted. TVA appreciates comments indicating that we have defined and met the specific purposes of this EIS.

A12. *Given the apparent minimal immediate need for additional source water, the intended purpose of the reservoir may be more to enhance real estate and recreational value in the area more so (or rather than) creation of additional source water. If so, the focus of the EIS should be environmental impacts on actions associated with increased urbanization and residential sprawl into rural areas.* **EPA, 51f**

Response to Comment A12: As indicated in several sections of the draft EIS (in particular Sections 1.1, 3.1, and 3.9), the third purpose of this evaluation is to "evaluate the environmental and socioeconomic impacts of several possible ways to meet the future water needs for communities within this river basin." As indicated in Sections 5.4, 5.10, and 5.11, real estate and recreational development may occur associated with one or more of the action alternatives; however, those activities are acknowledged to generate potential conflicts with the purposes of this project.

A13. *As suggested on page 1, the EIS is written much like a programmatic EIS since it generically explores a need for additional water supplies and leaves site-specific plans for the future. For example, the reservoir management plan for the Fountain Creek Reservoir alternative (B) was not developed, the environmental impacts of the new water treatment plant for the downstream intake alternative (C) were not included in the impact analysis, and the pipeline impacts for Alternatives C, E and B were also not disclosed. Page 39 also states that "TVA is not proposing to design or construct any of these facilities" and "[i]n this EIS, these action alternatives have been generally described in light of their conceptual nature at this early stage." Page 1 further states that ".., several of the alternatives would not have to be built for a number of years." While EPA agrees with the concept and need for programmatic EISs that are followed by site-specific NEPA documents, our concern is that this EIS was not titled as a programmatic EIS. This should be discussed.* **EPA, 51a**

Response to Comment A13: This document is intended to be a programmatic EIS; however, that term conveys rather little meaning to members of the general public. Appropriate parts of the document (especially Sections 1.1 and 3.2) have been modified to clarify the intended programmatic intent of this EIS.

A14. *It should also be noted that if the present EIS is not a programmatic EIS but rather is an action EIS, construction of the preferred alternative would need to be initiated within five years or a re-evaluation of impacts would be needed, If impacts were determined at that time to be significantly different, a supplemental EIS would be needed if the project was pursued.* **EPA, 51b**

Response to Comment A14: Comment noted.

A15. *Your report also covers (albeit briefly) wetlands, archeological resources, aquatic life land recreational considerations. These are all well and good to consider, but if you need water to sustain the basics of life, then someone needs to get the priorities right.* **Jerry C. Lashlee, 26d**

Response to Comment A15: As indicated in Sections 1.3 and 3.2, the TVA role in this evaluation is to assist local agencies in determining their future need for water and evaluating possible ways to meet the identified needs. Under the National Environmental Policy Act (NEPA), documents such as this EIS are required to evaluate the effects of proposed projects on “the natural and physical environment and the relationship of people with that environment.” The intent is “to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.”

A16. *From a practical perspective, implementation of the Fountain Creek Reservoir would utilize some 2,800 acres of the available Columbia lands previously acquired for the discontinued Columbia Dam and Reservoir. Such use would keep these lands in public ownership and under the direct purview of TVA. However, an additional 800 acres of land currently not in public ownership would need to be acquired for the reservoir.* **EPA, 51g**

Response to Comment A16: As indicated in Sections 1.3 and 3.2, the TVA role in this evaluation is to assist local agencies in determining the future

need for water and identifying ways to meet those future needs. Even if local interests decide a reservoir in the Fountain Creek watershed should be constructed, TVA has no plans to own, build, or operate that reservoir.

A17. *Consistent with the Federal Register, public comments are due to TVA by 10/30/00 as opposed to the 10/20/00 date stated on the DEIS cover page. Accordingly, we recommend that TVA receive comments postmarked by the 10/30/00 date.* **EPA, 51c**

Response to Comment A17: Comments were accepted into early November.

A18. *The Summary Comparison Table 6 on page 60 should also document a brief summary of natural and environmental impacts since environmental permit issues will be a major consideration in balancing benefits with impacts.* **Justin P. Wilson, Deputy to the Governor,43j**

Response to Comment A18: A summary of the environmental effects is included in Table 7, which is the companion to Table 6 and follows it in Section 3.9.

A19. *The draft identifies a variety of alternatives ranging from a traditional impoundment, pipeline options and a dam improvement alternative. A single alternative or combination of options can provide water well into the future. One or more of the alternatives addressed by the EIS may provide a long-term and reliable source of water.* **Justin P. Wilson, Deputy to the Governor,43c**

Response to Comment A19: TVA concurs with this assessment.

A20. *I know the people that has to make these decisions have a hard job. . . . You people that are inside have got to make a decision some way, and I'm for you if you can do something right but, if you can't, let's just don't go too far until we can get something else done.* **Jack Craig, 77d**

A21. *Mr. Craig was so correct in saying they need to definitely count the cost and don't start doing something that the environmentalists are going to come in and discount.* **Sharon Vaughn, 79d**

A22. *Does it say that the downstream water intake, is that a sure thing, can it be done, there's nothing to uphold it, the environmentalists or anything can't step in and say you can't take water out or is this a sure thing or is this just a guess? And then on Normandy, raising of that pool, is that a sure thing, can it be done, or are you going to have trouble raising that pool? And on the Tims Ford pipeline, is that a sure thing, or can they say, well, you don't get any more water. Are we going to the expense to do some of these and not have any assurance or get any water? And on Normandy, if they raise that pool or if it stays like it is, in a push and shove situation when we run out of water, is there any kind of guarantee that we are going to get water out of that dam? There's a lot of unanswered questions and until we know whether they are sure things or not, I don't see how anybody can make a projection on that they want.* **William Derryberry, 73a**

A23. *These four alternatives that you are suggesting were present at the time the other dam was built and, if they were present then, they ought to have been thought about and it should have been checked out and knew you could put water behind Columbia before*

it was ever built. If you are thinking about building a dam on Fountain Creek, we need to know for sure that the thing can be built. No need in building one and then tearing it down. $84M is a lot of tax money thrown away, not to think about the homes and lives of the people that live there. Fish and mussels and everything mean a lot but people's lives and their homes mean nothing to anybody. They need to be taken into consideration. **William Derryberry, 73g**

Response to Comments A20 - A23: Comments noted. The chief purpose of this evaluation has been to help everyone understand the variety of issues that ought to be considered when deciding how to meet the future needs for water in the watershed.

A24. *No preferred alternative was selected by TVA in the DEIS, although TVA has indicated a non-preference for the No Action Alternative (A). While acceptable from a NEPA perspective and understandable in the sense that TVA and its cooperators might want additional public input before selecting a preferred alternative, we note that delaying the identification of TVA's selection until the FEIS stage is late in the NEPA process. At that stage, the public and resource agencies would not be able to comment on the preferred alternative until the FEIS comment period, which may or may not truly influence any modification of the preferred alternative and would reduce the probability of a different alternative being selected if the public so-requested.* **EPA, 51h**

Response to Comment A24: As with the related Land Use EIS, TVA determined that members of the public and the affected agencies would benefit most from a wide-ranging discussion concerning several viable water supply alternatives. Especially when local agencies will have to build and defend the eventual project(s), we believe this approach results in better-informed decisions.

A25. *Given the potential serious impacts on aquatic fauna in several proposed alternatives, TVA is strongly urged to completely disregard Alternative B and D, and consider the possibility of constructing an offshore* [off-stream ?] *reservoir. Page 58 of the DEIS stated that this alternative was "adequately represented by the Fountain Creek Reservoir alternative." However, our proposed alternative represents an entirely different scope than a tributary reservoir. TVA should not consider these alternatives to be the same. Given the number of federally listed aquatic species in the Duck River system, and the relatively common nature of many of the terrestrial plants and animals, it makes much more sense to limit impacts to an offshore site. Impacts with this sort of alternative would likely only affect plant communities in the area. Since TVA has purchased the rights to 3,800 acres of land within the Fountain Creek watershed, surely a parcel of land exists where few sensitive plant or animal communities exist, or where these effects would be minimal. This alternative would preserve the biotic integrity of the aquatic fauna of the Fountain Creek system (182 spp.). Additionally, this alternative could adequately meet water supply needs if the containment reservoir was built to accommodate a large volume of water (ca. 1 billion gallons). Such a reservoir allowed to fill slowly would minimize cubic feet per second (cfs) removal effects if the water withdrawal area were around Duck River Mile 140-200. Furthermore, this alternative could allow construction of the reservoir near the river (within a few miles), therefore eliminating the need for a 10-20 mile pipeline. TVA should strongly consider including this alternative in their potential revisions or attachments to the DEIS.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33v**

Response to Comment A25: In order to meet the projected need for water in 2050, any potential source would have to be able to supply 14 mgd (22 cfs of flow) during all of a July-October drought period (123 days). The total volume of water used during this period would be approximately 1.72 billion gallons (14 mgd x 123 days), which equals 5,285 acre-feet of water. If the depth of the off-stream reservoir averaged seven feet, the usable volume of the reservoir would need to be 755 acres; however, to compensate for evaporative losses (at about three inches per surface acre per summer month) the reservoir would need to include 755 more acre-feet of water (5,285 + 755 = 6,040 acre-feet), or a total of 863 acres (6040 acre-feet/7 feet). At that size, the construction and operation of an off-stream reservoir would involve most of the same problems described for the Fountain Creek reservoir (land acquisition, landowner rights, controlling leakage, nutrient enrichment, long retention time, etc.). In addition, the water stored in the off-stream reservoir probably would be pumped from the Duck River during winter and early spring (the high flow period) when the river would contain large amounts of organic matter and nutrients resulting from non-point source runoff. The quality of the water in an off-stream storage reservoir might be too poor to release back to the Duck River without treatment and might be expensive to treat due to its high organic content and the likely presence of taste- and odor-producing algae. These are some of the factors which led TVA to conclude that an off-stream storage reservoir was not a reasonable and separate water supply alternative which needed to be evaluated in this EIS.

A26. *We strongly support a no-net-loss (similar to our Tennessee Wetland Conservation Strategy and the wetland protection initiative) approach to the management of public lands and our State natural resources. Although TVA outlines some protection of natural resources as part of the description of the proposed Alternatives, these are not specific and do not address long term protection of natural resources, specific sensitive habitat and species throughout the planning corridor.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64c**

A27. *In order to comply with the National Environmental Policy Act, consideration should be given to the comprehensive and cumulative impacts associated with the project actions. Considering the information provided, it is probable that any proposed pipeline development will increase stream crossings, will affect instream aquatic and riparian habitat, and thereby significantly degrading habitat as part of proposed construction implementation. The TVA has not identified restoration nor reclamation actions to lessen any construction-related impacts, e.g., best management practices or bioengineering techniques.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64b**

A28. *The relocation of Highway 50, any secondary roads, power transmission lines, water treatment plants and other related facilities of the presented alternatives, as well as other present, proposed and foreseeable future projects over a 10- to 20-year horizon in the region, should be considered and discussed in the FEIS.* **EPA, 51ai**

A29. *The impacts of the remaining action alternatives (C, D & E) are uncertain since impacts of pipeline routes (C & E) and specifics on treatment plants common to all action alternatives are not disclosed.* **EPA, 51n**

Response to Comments A26 - A29: The general nature of these issues are identified in the appropriate sections of the EIS; however, specific measures to protect them will have to be addressed in the subsequent NEPA and NPDES permit evaluation(s) for whatever projects are proposed to be built.

A30. *Given these considerations, our alternatives "preference" from most preferred to least is as follows: A, Modified E (if feasible), C, E, D and B.* **EPA, 51q**

A31. *If . .* [adoption of the No Action Alternative for the near term] *is unacceptable to local water authorities or if additional agricultural or water-consuming interests can be expected to withdraw significant additional volumes from the Duck River, EPA recommends that the most environmental alternative be implemented by approximately 2025. Voluntary conservation methods should be encouraged and employed regardless of which alternative is selected, with incentives and disincentives should be provided by local authorities for complying customers. Conservation should target those activities that consume water (e.g., lawn watering) as opposed to those that return a large portion of the water to its source (e.g., wastewater).* **EPA, 51j**

A32. *In summary, until a true water need can be demonstrated beyond what existing sources (Normandy flows and wastewater returns) and conservation methods can provide, EPA favors the No Action (A) for the near future. If this is considered unacceptable to local water authorities and implementation of one of the remaining alternatives (B-E) is pursued, we would not prefer implementation of the Fountain Creek Reservoir (B) or raising the pool of the Normandy Reservoir (D) due to their impacts. We also have environmental concerns about the alternatives with long pipelines (C and E) with unclear routes and undisclosed impacts. If the pipeline impacts could be minimized through alignment shifts and the impacts of new water treatment plants common to all action alternatives could also be minimized, we would favor C over E since it has a shorter pipeline than E, and E also involves interbasin transfer. However, we strongly suggest that the feasibility of a modification of E (Modified E) be considered, which returns additional wastewater to the Duck River as opposed to transferring it to the Tims Ford Reservoir.* **EPA, 51aj**

A33. *In summary, considering the Alternatives presented, we find Alternatives C and E least objectionable and these alternatives clearly present minimal environmental impacts when compared to other alternatives presented. We have concerns about the management of shoreline tracts (Alternative D) and decreased stream flows that could result from Alternative C. We suggest that these impacts be further addressed and documented in the Final EIS as well as the methods for avoiding impacts associated with implementing these Alternatives.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64r**

Response to Comments A30 - A33: Comments noted.

A34. *I still have faith in TVA doing the right thing, and I hope that this matter will be settled this time. I hope it will be sooner rather than later and we don't wait until we have a problem to handle it.* **Sharon Vaughn, 79e**

A35. *A review of the work and efforts put into the EIS reminds us that with each of the possible alternatives there remains many unanswered questions. A good foundation of knowledge has been established, but a great deal of work remains. . . . For us, this document is only the first step of a renewal effort to meet the anticipated need for WATER in the Duck River Basin.* **Larry E. Jones, 1b**

A36. *Work on the EIS has reminded all of us that with each of the possible alternatives there are still many unanswered questions. A good foundation of knowledge has been established but a great deal of work remains to be done. Those of us with a direct*

responsibility for water supply feel an increasing urgency to move forward with the process. For us, this document is but the first step of a renewed effort to meet the anticipated need for water in the Duck River Region. **Linda Nannie, Chairman, Duck River Agency, 20c and 71c**

A37. *I was born about 2000 feet south of Fountain Creek. I moved across it about 2000 feet when I was two, three, or four years old, and lived there until I was grown. After I come back out of service, I bought a farm on Fountain Creek and I've seen that stream real low. Everybody else that's been in that area has seen the same thing I have. I'm not smart; I'm not inside on this thing. If I was, it would probably be in worse shape than it is but I think we've got a problem and I think it's the most environmental thing that we are looking at of all the choices that we have.* **Jack Craig, 77a**

Response to Comments A34 - A37: Comments noted.

A38. *The support for <u>any</u> action is mixed and limited. Local trust of TVA has reached bottom. Any plan selected will incur undue opposition even though TVA has stated they would not participate in design or construction. The low attendance at your meeting of 9/28/2000 indicates poor local interest and support. When Columbia actually realizes that they are, or will be, short on their water supply, the deadheads will come alive and the politicians will climb aboard.* **Douglas K. Mitchener, 59b**

A39. *We do need to consider something for the long range. I don't want to say nothing about people in the past but if, in the 60's, we'd had leadership (and I don't mean local leadership; our local leadership wanted the Columbia Dam), but if we had leadership up higher, especially in Washington, who had some backbone to stand up to some environmentalists, we wouldn't be here discussing this today. The option I am looking for is for our children and the next generation not to have to come back to this auditorium or one similar to it where they are going to have to discuss the same thing - what are going to have to do about water. We have our chance now to solve the water for a long range and we need to have the backbone to do it.* **Wayne Romesberg, 72f**

Response to Comments A38 and A39: Comments noted. These comments reflect some of the negative perspectives which will have to be addressed when one or more water supply projects are proposed.

A40. *We recognize that this EIS -- like the TERDA EIS -- is burdened with years (and generations) of expectations, disappointment, and frustration. In this case, it was created by the anticipated completion of the Columbia Dam and its subsequent abandonment. Fortunately, the final EIS can benefit from improvements in conservation science and the science of water (supply and quality) management gained through the intervening decades. It is imperative that decisions in the final EIS also anticipate ethical considerations in preventing and managing present and future social conflicts over natural resources on the Duck.* **Marty Marina, Executive Director, Tennessee Conservation League, 58b**

A41. *As stated in the EIS, people living in the upper Duck watershed "will have to realize that protection of the quantity and quality of the water supply will be critical to their health and local economy," and "will have to work together to make sure each community has enough good quality water to meet their needs." As a member of this watershed community, The Nature Conservancy strongly urges that all residents, organizations, and utility districts assist the Duck River Agency in finding a long-term,*

regional solution that balances environmental concerns and economic development needs. **Leslie Colley, The Nature Conservancy of Tennessee, 44h**

A42. *It is extremely important to the local water systems and the Duck River Agency, which are jointly responsible for the water supply in the region, that this document has established an outline of the environmental issues and concerns that must be considered in the future development of the alternatives and the ultimate selection and completion of project and program solutions without prematurely limiting the alternatives. Over 30 years ago our predecessors anticipated the region's need for water and conceived of the Duck River project. They did not solve the problem indefinitely, but they did create Normandy Reservoir which sustains all of us and the main Duck River environment today. None of the current alternatives will sustain us indefinitely either. This EIS looks out to the year 2050 but there is nothing magical about that year. We owe it to the next generation to preserve alternatives and options that may be needed well beyond our lifetime.* **Linda Nannie, Chairman Duck River Agency, 20b and 71b**

A43. *The Duck River will be unable to supply Columbia's and Maury County's water supply needs by the year 2015. Maury County will have to find additional water supply sources to meet the water supply and water quality control needs of its citizens and industries. Since the halting of construction work on the Columbia Dam in 1983, no significant progress has been made toward meeting the future water needs of the lower Duck River area. An enormous amount of time and financial resources have been expended studying and documenting the obvious issues, needs, and solutions. It is imperative that no more time be lost. TVA, working with local water systems and Duck River Agency, has prepared an Environmental Impact Statement (EIS) on ways to meet projected water supply needs of the area. The draft EIS identifies water needs of the Duck River Basin and evaluates the environmental and socioeconomic impact of possible ways to meet future water needs without pre-selection of one alternative. The information contained in the discussion of general concepts presented can be beneficial to water planners and community leaders as they pursue a timely regional water resource. Obviously, important factors such as costs, consumer rate impacts, and site-specific details can and should be made by local and regional project sponsors.* **John R. Collier, Jr., Chairman, Board of Public Utilities of Columbia, Tennessee, 53a**

A44. *By addressing the environmental and socioeconomic issues of the alternatives early in the project's concept and design phase, we can create an opportunity for a successful project that balances community water resource needs, economics, and environmental impact. On behalf of CPWS water customers in Columbia, Maury County, and parts of southern Williamson County, we urge every responsible agency and community leader involved to show renewed determination and effort to complete the task of securing additional water supplies.* **John R. Collier, Jr., Chairman, Board of Public Utilities of Columbia, Tennessee, 53b**

Response to Comments A40 - A44: Even though they are stated in slightly different ways, all of these comments seem to imply that this EIS represents an opportunity to address the long-term water needs in the upper Duck River area without causing adverse environmental effects. If that happens, the document will have achieved all of its purposes.

B. Other General Topics

B1. *Complete the Columbia Dam; it should never have been stopped!* **Don F. Lee, 6c**

B2. *Dan* [Ferry] *it is not your fault, but people in Murray County still have a sour taste about TVA. I know you had the project dumped in your lap and it's not your fault but there are a lot of people that still have a sour taste about the Columbia Dam fiasco, and that's what it was - a fiasco. It should have never happened, but it did.* **Wayne Romesberg, 72j**

B3. *I know we all feel like that there has been a terrible mistake made and I think we are justified in doing this, us people that lived here. I had to move; my parents had to move, and a pretty good percentage of neighbors in our area had to move from where we were because of this thing and then it didn't work out besides all the tax dollars we put into it. I feel like if our friend Joe L. Evans had lived, the environmentals wouldn't had the problem we've had we would have had in here. I think we would have had a dam in Columbia today and been using it, but that's my opinion. It's not somebody else's, but I think when we lost our politics in Washington is the reason we don't have a dam in Columbia today. I hope, just like Buddy said and Mr. Jacobs, that we don't make this same mistake again.* **Jack Craig, 77c**

B4. *There were five options to accept or discuss, there really should have been six, number six being, the completion of the Columbia dam project. . . . The land is already acquired, the engineering of the dam is already complete and the preliminary work is already done. . . . The project will allow Maury County a growth of many years with water readily available, water sports and recreation would bring both increased populace as well as increased revenue to the county, due to the availability of water sports. . . . The disadvantages are few, one really, the possibility of one lost refuge for a mussel, mind you not the last refuge. No matter how you look at the entire scenario there is no logic for not completing the Columbia project. The benefits are not only to Maury county but all the surrounding counties as well, industry and manufacturing would find a greater attraction to the entire area. Mankind and the continuation of mankind as we know it should and must remain the top priority. There were five options mentioned in the article, none of which will meet the long-term needs of Maury County. The construction of another new dam on Fountain Creek would almost certainly meet the same resistance as the Columbia Project did, plus all the land is not acquired. It's time we looked at the needs of the majority not the desires of the special interest groups and met those needs. It's time to do what's "best for the business" and complete the Columbia Project.* **Jim Hillman, 16**

Response to Comments B1 - B4: TVA understands and appreciates the heart-felt nature of these comments; however as indicated in the Columbia Project Land Use EIS and in Section 1.2 of this EIS, in 1995 TVA determined that the Columbia Dam Project could not be completed as a dam and reservoir on the Duck River. Since then, TVA has been working with a variety of agencies to meet the purposes of that project in other ways. One of those purposes was water supply, which this EIS addresses.

B5. *I was born and raised here in Murray County, been here all my life practically, and I know you all have been through a tremendous amount with all this last 20-25 years. It has affected our county more than anything I've ever seen happen in this county. It's very disturbing to a lot of people to see things like this happen when we're suppose to*

have what I call common sense. We might not have a degree from some college but when you get into things like this, I think you need to use a little common sense. **Ed Jacobs, 76a**

B6. *I was nine years old when my grandparents sold their land to TVA and, of course, nothing came through as far as the dam. There's a lot of the older generation, my generation, that's all we remember is people selling their land and nothing has come of it. A lot of people have lost trust and they really need to keep this in the community versus bringing water from outside. We need to have our trust back and we don't want to be dependent upon anyone else for our resources. We want to be an independent county of everyone else.* **Cindy Short, 81**

Response to Comments B5 and B6: One of the potential benefits of this EIS is to help everyone in the upper Duck River watershed realize that good planning now can make a long-term difference in the availability of water for everyone.

B7. *Retain public land for public use.* ***No*** *new development on public land. Permanently turn over Duck River Dam property to TWRA.* **Nancy L. Penrod, 69b**

Response to Comment B7: Comment noted. Uses of the Columbia Project lands were evaluated in the Land Use EIS.

B8. *I feel that the options presented are viable; however, I believe that the gentlemen from the County Commission that talked about we need to take care of this locally was very correct and that we need to handle our own water issues and not be as dependent on other counties and other areas to provide our water. This is a local issue.* **Sharon Vaughn, 79b**

B9. *Ultimately, the decision to make a proposal to replace the water that would have been provided by the Columbia dam and to offer it for federal and state permits resides with the community. The TVA has acted responsibly and prudently to aid the community to make the necessary decisions. We commend your leadership and offer our assistance for a final resolution.* **Justin P. Wilson, Deputy to the Governor,43l**

B10. *I would like to say this is a local issue and it should be solved by the local people. We don't need environmental groups from California (western states), we don't need environmental organizations in the southeast to help solve our problems, and we definitely don't need another attorney from Murfreesboro to try to solve our problem. We know what happened last time there . .* [words lost on tape] *. . besides him getting rich. I think anyone here tonight needs to speak, state who they are, where they live, and if they represent any organizations.* **Wayne Romesberg, 72a**

Response to Comments B8 - B10: TVA concurs that addressing the future water needs of the Columbia area is a local issue. As stated in the EIS, TVA has prepared this evaluation of the need for water and the comparison of several possible ways to meet the identified need to help local agencies and the public understand the choices that are available.

B11. *Local governments, within the assistance of the Duck River Agency need to set up a commission of affected counties to plan and formulate a set of action steps to address the water supply issue for this region.* **Charles Sanders, 15a**

Response to Comment B11: This is one of several ways decisions could be made with regard to meeting the future water needs of the area.

B12. *Now, if a major wastewater treatment plant and associated infrastructure is built for our State Park and areas around the lake, as a trade off, the issue of water quality on Tims Ford Reservoir can change. Most importantly, we need to change the way we do business around here. Yesterday, we worked on Tims Ford Reservoir planning, today it's the Upper Duck River Basin planning. Wouldn't it be advisable to do comprehensive regional planning? TVA is doing most of this at our expense. It appears we are takers of whatever we are told we can do. Franklin and Moore Counties can only develop small parcels in a small way--yet, our neighbors in Maury, Bedford, Marshall, and Williamson counties get whatever they need at someone else's expense, including our water. I take issue with this approach and request that TVA either leave us alone, or help us help others by giving us some tools to protect our precious resources and thus have them available for all to use not just 50 years from now, but for all time beyond 2050.* **F. Montgomery Adams, Jr., Franklin County Executive, 29f**

Response to Comment B12: While everyone might not think so at any given time, TVA always attempts to act responsibly with regard to the wise use and conservation of the natural resources in the entire Tennessee River watershed. Acting responsibly also does not always mean that TVA can or should assist everyone in doing what they want, just because they want it.

B13. *While unrelated to the environmental impact issue, the financing of a future water supply is a major consideration. The 5¢ per thousand gallons TVA has collected from the Columbia area should be forfeited since they failed to complete their contract as scheduled when appropriations by Congress were approved.* **Douglas K. Mitchener, 59h**

B14. *Although it is not a specific part of this analysis, we commended TVA for meeting another state criteria to resolve its obligations for water. The setting aside of locally derived trust funds for regional water supply projects represents sound judgment and necessary fairness. These funds can play a significant role in the funding of an alternative addressed in the EIS.* **Justin P. Wilson, Deputy to the Governor,43k**

B15. *The 5¢ per thousand should continue to be collected from <u>all</u> users of Duck River water. Revenue collected from Shelbyville and upstream would be used for the maintenance of the Normandy Lake and river system water quality down to the Lewisburg intake. Revenue from Columbia, Lewisburg and Spring Hill (if they build their own water intake) would be added to funds already collected. Thus an account for future construction of the Williamsport Water intake would be established, funds would be controlled (and audited) by a representative(s) of each contributing system.* **Douglas K. Mitchener, 59i**

Response to Comments B13 - 15: As indicated in the Land Use EIS, the 5¢ per thousand gallons surcharge was collected by the Duck River Agency, not TVA, and placed in a trust fund to meet the local financial contribution to completion of Normandy and Columbia reservoirs, components of the Duck River Project. Subject to certain conditions, TVA has agreed to transfer the money in the trust fund to help respond to the water supply needs in the Columbia area. Future collection and use of this type of surcharge should be determined by people in the affected area.

B16. *We in Tennessee deserve better and demand more judicious treatment of our life-giving rivers. There is far more value to a river than simply its supply of water for human consumption. It seems that TVA should have learned this lesson from its loss of prestige due to the highly unpopular Tellico Dam, which destroyed one of the most beautiful rivers in the Nation, and from its experience in the abandoned Columbia Dam fiasco.* **Floyd and Linda Ayers, 32d**

Response to Comment B16: TVA agrees that the waters of the Tennessee Valley have many beneficial uses. Domestic water supply, recreation, and fish and aquatic life uses are all very important. One of the purposes of this EIS is to examine the potential impacts of each of the four action alternatives on existing and potential uses of the streams and reservoirs.

B17. *Let me say a few words about the Duck River Development Agency. You have changed your name so many times; you have changed your mission statement. I don't even think you recognize yourself when you look in the mirror. I don't. What have you done for Maury County. Name one thing. I don't think you can. Maury County has contributed over half of that nickel on a thousand gallons. What have you done for Maury County? Went to Hickman County and built them a water park or something like that for about $45K. You didn't even do that for Maury County. Why Maury County would even give you our support is beyond me. The Duck River Development Agency was created for one reason, maybe two. They gave one man a job for the rest of his life that nobody else could hold as long as he was alive, and you have been sopping up that nickel on a thousand gallons since 1972 and you still are. Thirty five years down the road, have you accomplished anything? Do you think in another 35 years you will have accomplished anything? You haven't done a thing, not a thing. Mr. Murdock, I told you once, I will tell you again. You got a lousy job. You're going to try to straighten up something somebody has made so crooked, bless your heart. Go back to Florida.* **Carolyn Derryberry, 74b**

Response to comment B17: Comment noted. TVA and DRDA recognize the strong feelings some have about the Columbia Reservoir Project and the agencies involved in it.

B18. *The only thing we are guaranteed by the Duck River Development Agency is that we pay a nickel on the thousand gallon but, in the DRA's legal response to TVA contractual audit March 26, 1998, page 54, the nickel per thousand gallon has not paid for water taken from the reservoir but from the Duck River. Again, it is not payment for water, it is a payment for a promise but undelivered - a two-dam reservoir project. That was stated in that audit. In the contract between TVA and the Upper Duck River Development Agency dated July 1, 1971, page 13-14, in the contract between the Upper Duck River Development Agency and the five public water utilities, including the City of Columbia, page 3 and 4, it first states they guarantee so many million gallons to all of them, and on the next page it says neither the TVA nor Agency guarantees the availability of the foregoing amounts of water. The only thing that was guaranteed was that nickel on the thousand gallon and these contracts. Everybody in Maury County and Marshall and all of them need to ask for these contracts and read them. You'd be surprised what you learn.* **William Derryberry, 73f**

Response to Comment B18: Comments noted.

B19. *Now I have a ruling on a U.S. Supreme Court case. Some ranchers in northern California and southern Oregon asked the EPA for water from reservoirs in that area* [but] *they turned them down, so they carried it to the United States Supreme Court. The ruling was in favor of the ranchers and against the environmentalists. This ruling is number 95813 Supreme Court of the United States Argued November 13, 1996, Decided March of 1997. I wish you would get a copy of that, look at it, and see if we file a lawsuit to get rid of the Pearly Mussel. . . . . We need to send the EPA a lawsuit about the Pearly Mussel or any other thing in the way and get the Corps of Engineers to build a dam for us or help get us one built because it looks like TVA don't want to at all.* **Glenn Stevenson, 78d**

Response to Comment B19: Comment noted.

C. Water Needs

C1. *A variety of unresolved issues and unmet obligations remained after the closure of the Columbia Dam project. First and foremost of these is the need to resolve the long-term water supply needs of the Upper Duck River Basin. In* ***Governor Don Sundquist's view, clean and dependable water for the Columbia region is as fundamental to the economic growth of the region as is dependable, low-cost electricity. This is the State's overriding concern.*** **Justin P. Wilson, Deputy to the Governor,43a**

Response to Comment C1: TVA agrees that clean, dependable water supplies are needed in the upper Duck River region. Each of the action alternatives discussed in the EIS is capable of meeting the projected water supply need through the year 2035 or 2050. The residents of the area can be confident that their long-term water needs would be met by one or more of these alternatives.

C2. *The solution to the projected problem(s) in the Duck River watershed should be solved in the Duck River watershed. Only as a last resort should the other watersheds adjacent to it be asked to share their dwindling resources. This is not a selfish comment, but a matter of possible future survival. The mighty Colorado River was once thought inexhaustible. There have been so many diversions for so many reasons, that it is only a small part of what it once was. We can't let that happen here.* **Jerry C. Lashlee, 26f**

Response to Comment C2: Comment noted.

C3. *Now air is our number one most valuable thing and water is next, second. We can't do without either one of them too long, so for the benefit of the future, TVA paid me for a 100 acres just above the dam not too far. I'd rather see it covered with water than to give it back to me or sell it back to me. Water is going to be a problem all over the world at a certain time. Atlanta is hunting water; Dallas is hunting water; . . . we don't know what year it is coming. It may be two years or twenty years but it's coming.* **Glenn Stevenson, 78e**

Response to Comment C3: Comment noted. TVA, in cooperation with local water systems, has been able to estimate when additional water would be needed in the Duck River at Columbia. As indicated in Section 2.8, during drought conditions between the years 2015 and 2025, the water demand at Columbia would exceed the amount of water available in the Duck River.

C4. *One of the biggest concerns that we have in Marshall County is water. When we apply for community development block grants, one of the criteria for getting the grant is to test the wells of the potential customers. In almost all cases these reports come back with a positive contamination report. It is in the best interest of Marshall County to find a new source of water other than the Duck River.* **Terry Wallace, Marshall County Executive, 65c**

Response to Comment C4: Microbial contamination of groundwater is very common in many parts of the upper Duck River watershed. The shallow soil underlain by limestone rock provides many opportunities for contamination from animal and human waste to percolate down into the groundwater. This also is the reason why public water systems with effective water treatment capabilities are so important to the region. Section 2.8 indicates that the future water demand in the Marshall County Water Service Area can be met by the Duck River.

C5. *More emphasis must be placed on future water needs throughout the basin. Normandy Reservoir is already not meeting the stated objectives. The release from the dam is already curtailed each year through the winter to allow the reservoir to be filled by the limited rainfall that occurs in the basin. Even at this reduced release, the reservoir has not reached full pool by the target date in some years. Fortunately, timely summer rainfall events have allowed the reservoir to be filled to full pool or higher. To date, the area has just plain been lucky.* **Randal J. Braker, 70a**

Response to Comment C5: TVA agrees that more emphasis is needed on water issues in the upper Duck River watershed. TVA also believes that Normandy Reservoir has met, and is continuing to meet, its project objectives. When Normandy reservoir was planned, TVA recognized that the recreation pool elevation of between 870 feet to 875 feet could be maintained only 90 percent of the time. TVA implemented water conservation operation measures during the drought of 1980-1981 and during the drought of 1987-1988 to keep the reservoir pool elevation as near normal as possible while meeting the intent of the downstream water quality and water supply minimum flow objectives. These operations to conserve water have been continued to date to benefit the water supply of the Duck River Utility Commission. TVA has effectively used the water from summer rainfall events to help maintain lake levels as high as practical during recent dry summer months.

C6. [I]*f you use A, B, or C or whatever down here, Lewisburg and Shelbyville hasn't got any guarantee that they're going to have sufficient water in the future. If you put the pipeline in, Shelbyville gets the benefit of the water; Lewisburg gets the benefit of the water; we get the benefit of the water. It comes downstream and our cost and environmental impact on the pipeline is negligible . . . as it has already been told here tonight. So I don't really see why it is really such a complicated matter to solve our water problems, and we are talking about 2050, that's 50 years off. So I believe the figure on that was $13M and I'm sure a fellow could run a 30-inch pipeline for $13M and put a couple of pumping stations on it. You're amount of people to operate it and see after it and whatnot.* **Ed Jacobs, 76c**

Response to Comment C6: Comment noted.

C7. *It is clear to the DRA Board of Directors and to the managers of the regions water systems, who serve on our Technical Advisory Committee and work each day to remove the pollutants from our drinking water, that we are not separable from our environment. If we are to continue to enjoy the quality of life that is Middle Tennessee, we must take steps to ensure that there is abundant clean water for all elements of the environment. With each day that we delay, additional stress is placed on the environment and solutions become more costly.* **Linda Nannie, Chairman, Duck River Agency, 20d and 71d**

Response to Comment C7: TVA appreciates the efforts of the water supply systems in the upper Duck River watershed to produce safe drinking water. The purpose of the EIS is to help guide future coordinated efforts of these systems to ensure that there will be safe, dependable water supplies for the region's growing population and economy.

C8. *This situation was calculated years ago by the TVA when the Columbia Dam was proposed and mostly built. Now that the dam project has been canceled, the chickens have come home to roost. Water, plentiful and clean, is the most compelling issue we will all face in our lifetime. We have watched as the Upper Duck River Basin has*

evolved into a major growth area complete with all the problems that come from lack of sufficient planning and unbridled growth. **F. Montgomery Adams, Jr., Franklin County Executive, 29a**

Response to Comment C8: Comment noted.

C9. *Although there seems to be a perceived need by some of the locals (pg. 10) for additional water supplies in the watershed, the actual need seems unjustified at this time for the Bedford and Marshall County service area through 2050, based on the needs analysis in the DEIS. However, for the Maury and southern Williamson County service area, water supply is expected to become a growing issue after 2015. The DEIS indicates (pg. 31) that by 2025 the unmet need would be 6 cfs (4 mgd), by 2035 it would be 14 cfs (9 mgd), and by 2050 it would be 22 cfs (14 mgd) beyond the 40 cfs available from the Normandy Reservoir. However, page 35 notes that "[t]hese amounts of water would be needed only during extended drought conditions, when demand was at its maximum and nearly all of the flow in the river was supplied by the minimum discharge from Normandy Dam."* **EPA, 51d**

Response to Comment C9: The purpose of the Water Supply Needs Analysis was to help local water systems and residents identify where and when additional water would be needed and how much would be required.

C10. *EPA is not convinced that a water supply alternative is needed at this time for the area of concern, particularly the Bedford and Marshall County service areas. In regard to Maury and southern Williamson County, we believe the determined unmet need during droughts starting in 2015 through 2025 (4 mgd or 6 cfs) could and should be met through water conservation. The 2035 unmet need (9 mgd or 14 cfs) could arguably also be met through conservation. The unmet need for 2050 (14 mgd or 22 cfs), however, is approximately 50% above the 40 cfs baseline Normandy flows, and therefore would likely require additional water supply. However, that need is many years away and would only apply during drought situations. As such, based on the DEIS, EPA believes the need for additional water supply is unfounded for the Bedford and Marshall Counties and can be met by conservation methods for some time (through approximately 2025 or 2035) for the Maury and southern Williamson Counties during droughts. At this time, therefore, EPA favors the No Action Alternative (A) for the near term. We recognize, however, the value of early planning for future needs in order to determine an adequate and environmental approach to additional source water.* **EPA, 51I**

Response to Comment C10: Section 2.8 of the EIS indicates that the estimated future water demand of the Bedford County and Marshall County Water Service Areas can be met by the Duck River and no action would be required to address water needs through 2050 in those water service areas. The estimated future water demand of the Maury/southern Williamson County Water Service Area would begin to exceed the amount of water available in the Duck River after the year 2015. Throughout the United States, water conservation efforts have been documented to accomplish about a 10 percent savings in average daily water use. If the Maury/southern Williamson County Water Service Area would implement a water conservation program and accomplish a 10 percent reduction in total water demand, the result could be a water savings of 3 mgd (4.6 cfs) in 2025, 3.5 mgd (5.5 cfs) in 2035, and 4.0 mgd (6.2 cfs) in 2050. These savings, while significant, would only partially offset the need for additional water. The additional water that would still need to be met by would be 1.4 cfs in 2025, 8.5 cfs in 2035, and 15.8 cfs in 2050.

Water conservation in the Bedford County and Marshall County Water Service Areas also could increase the amount of water available in the Duck River at Columbia and, if effective, could further delay the need for additional water sources. A 10 percent reduction in water use in Bedford and Marshall counties could defer the need for additional water in the Maury/southern Williamson County Water Service area until after the year 2025 and, if the conservation measures continued to reduce the demand by 10 percent, the additional water that would be needed in the Columbia area could be reduced to 5.5 cfs in 2035 and 12.3 cfs in the year 2050. Considering how long it takes to design, engineer, permit, and construct most possible water supply solutions (especially reservoirs), this examination of water supply needs and alternatives is both timely and appropriate.

C11. *Shelbyville is predicted to exceed the water supply allocation for Bedford County from Normandy Reservoir soon after 2050. Will the area be stopped from withdrawing water or will the Lewisburg area be forced to make due with a lower flow in the river?. Raising the height of the dam at Normandy Reservoir is clearly the best choice because it solves these existing problems with the releases from the dam and also solves the shortages at Columbia.* **Randal J. Braker, 70b**

C12. *The Alternative D, raising Normandy, this may be semi-acceptable but it is definitely better for the upper reaches of the Duck River than for the lower regions like Marshall, Murray, Hickman, Humphreys, that in the long run probably will not help solve us as well as they just said. We still* [would] *have to do water conservation in 2035, so basically that means our children will have to be back in 2035 to try to find another answer that we didn't solve.* **Wayne Romesberg, 72d**

Response to Comments G11 and C12: The purpose of this EIS is to evaluate ways of meeting the need for water in the upper Duck River basin through 2050. This evaluation used state-of-the-art projections about future population growth in the area that were provided by the U.S. Geological Survey. Local and regional planners will have to recognize when population growth and the demand for water begin to vary from these projections and start planning to meet the revised future needs. By 2035, it is quite likely that assumptions made in this EIS concerning the ways water is used and its value will have changed sufficiently to warrant renewed interest in long-term planning for water needs in the area.

C13. *To the people here, consider the source. In 1965, we had the same people* [TVA] *telling us we were fast approaching a water shortage. In 1965, there was a little biddy blue book in Murray County library published by TVA that said by the year 2000, Murray County would be using 40 million gallons a day. We don't come anywhere near that. They were wrong then, what's to say you are right now?* **Carolyn Derryberry, 74a**

Response to Comment C13: In 1965, Maury County had several industries which used large amounts of water to wash and process phosphate ore. Those industries have since ceased operations in the area, considerably lowering the industrial water demand. Even though population has increased substantially, industrial water use in the Columbia area has declined from about 29 mgd in 1965 to about 4mgd in 2000.

C14. *We are concerned that future use projections were based upon the assumption that "no new large water-consuming industries would locate in any of the water service areas in the upper Duck River basin." We feel that the leadership of the cities and*

countries of the area should have the opportunity to be involved in the adoption of any such assumption as its use might, unintentionally, place a "water cap" on economic growth in the region. The I-65 corridor is an area in heavy demand for industrial development. While extremely heavy water users (5-10 MGD+) would probably not consider the area due to its basic scarcity of water and lack of large receiving streams, a few new industrial users in the 1-2 MGD range could be vital to the area's future economy. More importantly, existing water using industries may be negatively impacted in their future decisions regarding expanding in place or having to relocate. **Wilton Burnett, Jr., Special Projects, Department of Economic and Community Development, 63a**

Response to Comment C14: As indicated in Section 2.5, the future demand for water in the upper Duck River watershed used in this EIS was determined by the U.S. Geological Survey in conjunction with the DRDA. The specific set of projections used as worst case conditions in the EIS include additional industrial growth in the Maury/southern Williamson County Water Service Area beyond the steady growth projected to occur in the Marshall and Bedford County water service areas. This liberal growth projection for the Maury/southern Williamson County Water Service Area would accommodate a good deal of additional industrial water use but does not, and cannot, account for any specific, large, self-served, water-using industries which might decide to locate in the watershed at some time in the future. As indicated in the comment, however, extremely heavy water users would probably not consider locating or expanding in this area due to its basic scarcity of water and lack of streams capable of assimilating large volumes of wastewater.

C15. *The draft EIS addresses anticipated water demand without considering the impacts of low flow scenarios - similar to those presently being experienced - on maintaining river function. TVA's experience this summer in managing the water supply for Chattanooga and northeast Tennessee speaks to what happens when God does not provide enough rain to create adequate runoff.* **Marty Marina, Executive Director, Tennessee Conservation League, 58d**

Response to Comment C15: The analysis of water available in the Duck River for water supply withdrawal is based on severe drought conditions such as occurred in 1953 when a U.S. Geological Survey team observed that there was no flow entering the Duck River from tributary streams between Shelbyville and Columbia. Under such a scenario, the only flow in the river would be that supplied by releases from Normandy Dam, wastewater return flow, and drought flow from Fountain Creek. Sections 2.6 and 2.7 describe these conditions. The dry summer months experienced in the Duck River during 1999 and 2000 were not as severe as the drought conditions used in the Water Needs Analysis and evaluated in the EIS.

C16. *It's unfortunate Columbia and the Duck River watershed are outgrowing their natural resources. However that is their problem. Rather than rob Peter to pay Paul, Peter should adjust his lifestyle to fit his resources. If the Duck River cannot supply sufficient water needs in the years to come, then growth and expansion should be minimized rather than maximized. Also, the overflow from Davidson County is fast filling Williamson County. By 2050, all of Williamson County will need much more water to meet those growth needs and you will be looking for ways to provide that increase. If you're drawing from Tims Ford, you'll want to draw even more. Once the cycle is started, bureaucrats find it easy to make the cycle even larger.* **Jerry C. Lashlee, 26b**

C17. *Quoting the EIS "The primary focus of the EIS is the future water supply needs in the Columbia area .... and .... form the basis for completing the remainder of this evaluation". This primary focus does not take into account the water supply needs in the Franklin County area. One might describe this view as "tunnel vision".(Page 11)* **Mark H. Dudley, 24c**

C18. *We're growing in the Elk River watershed also. Our needs are also increasing. Have those been addressed and the increase been included into your equation? I saw nothing in your brief that would lead me to think so. In fact, there was nothing in there that made any kind of mention to the effects on the Elk River watershed, either present or future.* **Jerry C. Lashlee, 26e**

C19. *There is an even greater reason for TVA not to consider Alternative E. The water in the Tennessee Valley belongs to the citizens of the Valley, not to TVA. By moving water from one area to another, TVA is assuming they have ownership of the water. If the citizens in this (Winchester) area objected, and this action was contested in court, I do not believe it would be judged legal.* **Eugene J. Sanders, 39b**

C20. *Steal the water from the Cumberland River; blast the rock away and put in an enormous pipeline to serve the burgeoning South Nashville Metro Population! Tell the COE to cooperate!* **Don F. Lee, 6d**

Response to Comments C16 - C20: The future water needs of the Elk River watershed are as important to TVA as those in the upper Duck River watershed. Local water districts and local governments, with the assistance of various state agencies will decide which water supply alternative(s) should be pursued in the future. The Tims Ford Pipeline alternative would likely be viewed as unreasonable if the water transfer would constrain economic growth in, or otherwise adversely affect residents of, the Elk River area. In anticipation of residential and industrial growth, TVA included large amounts of water for municipal and industrial water supply use in Tims Ford Reservoir. Based on the estimated population growth in Franklin and Moore counties, a surface water withdrawal of about 10 mgd could reasonably be expected by the year 2050. At the normal summer pool elevation of 888 feet, the reservoir holds 535,000 acre-feet of water and the estimated future water need of 10 mgd is small in comparison to the volume available. There would be enough water in Tims Ford reservoir to meet growing water needs in Franklin and Moore counties as well as supply water to the Duck River without impacting existing uses of the reservoir.

The water transfer to the Duck River from Tims Ford Reservoir would not be needed every year or for longer than 3 or 4 consecutive months at a time. In most years, the Duck River has enough water to meet even the projected future needs within the watershed. To evaluate potential impacts of a water transfer, TVA analyzed what would have happened during the severe drought of 1987-1988 if a pipeline had been withdrawing 22 cfs from Tims Ford Reservoir from June to October. The analysis showed that the withdrawal would have lowered the reservoir pool elevation by 8 inches in 1987 and 7 inches in 1988 during the recreation period. If Alternative E was to be considered for implementation, additional analysis would be performed to better document the potential impacts on the recreation pool level, as well as effects of increased water withdrawals by public water supply systems.

C21. *I believe business and residential water rates in the Duck River watershed should be increased to allow demand to match their local supply without "raiding" the Elk River's watershed. I do not want to sacrifice the Elk River merely to allow cheaper water rates in other areas.* **Ken McGarry, 13b**

Response to Comment C21: A review of existing water rates would be one of the first logical steps in implementing a water conservation program. One of the first adjustments that a water system could make would be to revise water rate structures to encourage conservation instead of water use. TVA believes it would be beneficial for all water systems to implement water conservation programs.

C22. *The document fails to discuss water conservation as an alternative or supplement to the action or no action alternatives. Efficient use of existing supplies can save money, obviate the need for additional water storage capacity, and prolong the use of existing supplies during shortages. Successful implementation of water conservation measures depends on regulatory action by state and local governments and management decisions by the local utility. Typical measures are codes and ordinances that mandate water conservation through the use of plumbing fixtures, use of reclaimed water, installation of meters, leak detection programs, rate structure changes, and public education programs. As previously indicated, voluntary conservation methods should be encouraged and employed regardless of the alternative selected, with incentives and disincentives provided by local authorities for complying customers. Conservation should target those activities that consume water (e.g., lawn watering) as opposed to those that return a large portion of the water to its source (e.g., wastewater).* **EPA, 51r**

Response to Comment C22: TVA agrees that water systems in the upper Duck River watershed should implement water conservation programs regardless of the outcome of this EIS. The typical conservation measures identified in this comment have proven to be effective in reducing water use. Specific components of water conservation programs implemented in the upper Duck River watershed could be tailored to the size and capability of each individual water supply system. The discussion of water conservation in Section 3.8 has been expanded to include this concept.

D. Alternative A - No Action

D1. *The most sensible and logical course is to use alternative "A" or take no action.* **Douglas K. Mitchener, 59a**

D2. *I believe the "no action", Alternative A is the correct course of action. The bunch of morons that stopped the Columbia Dam must reap what they sowed. If the dam could not be constructed because changes to the river threatened "the rich flora and fauna of the Duck River", then other changes to the river and local environment cannot be allowed, either. Sorry, Charlie.* **John Albright, 2**

D3. *Alternative A, the alternative of doing nothing, to me that is not an answer, so we should not even consider that.* **Wayne Romesberg, 72b**

D4. *Based on our evaluation of the Draft EIS, we agree that Alternative A (no action) is untenable given the projected population growth of this region.* **Leslie Colley, The Nature Conservancy of Tennessee, 44b**

D5. *Using the present resources is an untenable solution because the system is presently functioning near its limits.* **Marty Marina, Executive Director, Tennessee Conservation League, 58f**

D6. *One of the things that I know we do not need to do is to do nothing. One of the things that most concerns me, not only as a resident of Murray County but also as a businessman in Marshall County, is the ability to have water to use for not only drinking but for fire protection and all the many associated needs of water.* **Randy Short, 80a**

Response to Comments D1 - D6: Comments noted.

D7. *According to your introductory or cover letter accompanying this Draft EIS, the purpose of the Study was to identify "potential ways to meet the projected water supply needs..." Based on this statement, a "do nothing" alternative does not meet this basic criterion and is therefore academic.* **Frank M. Tamberrino. President, Maury Alliance, 66a**

Response to Comment D7: Consideration of the No Action Alternative is a required part of a NEPA review. In this EIS, the function of the No Action Alternative is to indicate what would happen in the area if nothing was done to address the projected future water needs. Routinely, the No Action Alternative establishes a baseline for evaluating the effects of the action alternatives.

E. Alternative B - Fountain Creek Reservoir

E1. *Build Dam on Fountain Creek.* **Joe P. Due, 49**

E2. *In favor of Fountain Creek Reservoir.* **Doug Wooten, 36**

E3. *In favor of Fountain Creek Reservoir for fishing.* **Steve Sacchinelli, 37**

E4. *I would choose the fountain creek option if I were to choose.* **Kent Curtis, 4a**

E5. *After reviewing all of the alternatives that were discussed at the public hearing in Columbia, it is my opinion that the Fountain Creek impoundment would be the best alternative for Marshall County.* **Terry Wallace, Marshall County Executive, 65a**

Response to Comments E1 - E5: Comments noted.

E6. *Fountain Creek Dam, I feel, would be helpful in our water supply. I believe the people of Maury County would support the Fountain Creek Dam. We need the water supply. I hope the damage to our land would be minimal* [c]*ompared to what has already been damaged by the Big dam project.* **Debbie J. Grissom, 68**

E7. *So the solution I see is B, the Fountain Creek Dam. Granted, it is more expensive but sometimes you do have to bite the bullet to solve a problem and this is the bullet. . . . . But in the long haul, I do feel like Alternative B, the Fountain Creek, is our best alternative for us, our children. and generations to come.* **Wayne Romesberg, 72g**

E8. *In looking at all the alternatives to having enough water for the area of Murray, Marshall, Bedford Counties and also Williamson County, I feel the best solution would be a reservoir in the Fountain Creek area. It's going to provide more water than all the other three alternatives combined. . . . . Let's build a reservoir; let's get it over with; and let's get on with the future.* **Randy Short, 80b**

E9. *The only long-term quality answer for Maury County is the reservoir on Fountain Creek. The money will come from local money and benefit the people of Southern Middle Tennessee. This resolves a problem that many people have realized existed for a long time - need for quality water supply. Its time has come. Dam up Fountain Creek.* **W. Roger Witherow, 11**

E10. *This department recommends a serious consideration of the Fountain Creek alternative, Alternative B, because it presents the greatest buffer or excess water availability for future use. Alternative B projects to give a 39-40 CFS excess over the 100 CFS baseline needed in the Duck River while C and E project to give excesses of only 10 and 2 CFS respectively and D will go below the baseline need. These figures are based upon the "no new heavy water users" projection.* **Wilton Burnett, Jr., Special Projects, Department of Economic and Community Development, 63b**

Response to Comments E6 - E10: Comments noted. Alternative B does have the potential to provide the most water to the Columbia area.

E11. *I think that the Fountain Creek impoundment would enhance the region of Marshall and Maury County by providing this two-county region with a source of water for drinking as well as recreation. The impoundment could also be used as an emergency*

source of water. A plan could be worked out for a water treatment plant to be built that could serve Marshall, Maury, and southern Williamson County with a water supply that could possibly connect a water grid system to help get water to parts of the counties that do not have a public water supply. **Terry Wallace, Marshall County Executive, 65b**

E12. *I am strongly in favor of the development of Fountain Creek Reservoir for several reasons. Firstly, it encourages economic enhancement in a positive and non-toxic (industrial) growth. Secondly, it would become a central recreational magnet for Colombians and surrounding counties to enjoy in every season. Lastly, it is an ample and manageable water supply that's not shipped in via pipeline from Normandy or Tims Ford. It would also demand that our ancient H_{20} treatment facility be upgraded to accommodate the lake. This alone, is a gain. Though I am aware that the estimated cost is higher for the lake project, the benefits our community would receive, far outweigh the cost of completion. We deserve to have this lake project completed after enduring all the burdens from the entangled Duck River Dam project.* **Marian J. Haynes, 48**

E13. *Certainly the Fountain Creek Reservoir would benefit all of lower Middle Tennessee in more ways than just water supply. Doesn't this community deserve this kind of economic and recreational stimulation after suffering the twenty-five year debacle of the Columbia Dam? With substantial resources and infrastructure already committed to support this proposal, let us move ahead with the commitment to finish this reservoir project. No other alternative redresses the travesty which has been the earmark of this project heretofore.* **Lewis P. Haynes, 40**

Response to Comments E11 - E13: Alternative B could supply a large quantity of water; however as indicated in Sections 5.4 and 5.11, protection of that water supply source probably would involve restrictions on recreational and other use of the reservoir.

E14. *The Fountain Creek Reservoir is the most practical solution to Maury County's and southern Williamson County's fifty year water needs, and does not disturb Duck River downstream. Alternative "B" Fountain Creek Reservoir appears to be the only solution Maury County can consider concerning the economical growth. Water is the first thing a prospective employer asks about. Depending on a pipe line supply or over-worked (90 miles away) Normandy Reservoir would bring the growth of our county to a halt: if not now, in ten to fifteen years. Maury and Williamson counties, along with the other partner along the path of the Duck River, cannot let the need for water impede our growth.* **Ralph G. Maddux, 23a**

Response to Comment E14: Each of the action alternatives could meet the projected water needs of the Columbia area through 2035 or 2050.

E15. [T]*he Board of Directors of the Maury Alliance, a public-private partnership for economic development in Maury County,* [has passed a resolution] *which clearly states our support for the Fountain Creek alternative. This alternative provides a long-term solution to the current and projected water needs of this area, much as the original dam was supposed to.* [T]*he Maury Alliance Board of Directors believes that: a) The recognized time for projected water demand to exceed existing water supply in the Columbia region is the year 2015 and that action to address the issue well before that time should begin now, b) The Fountain Creek Reservoir alternative can supply the*

largest amount of water of the proposed alternative, in fact almost the same volume as the other alternatives combined, and c) The Fountain Creek alternative is the best, most logical solution to an imminent water supply issue, best approximates the earlier and original conceptual solution to address the long-term water needs of the greater Columbia area and appears to be cost-effective from the preliminary analysis. **Frank M. Tamberrino, President, Maury Alliance, 47a**

Response to Comment E15: Comments and recommendations noted.

E16. *I am opposed to Alternative B (Fountain Creek Reservoir) on the basis of cost and habitat destruction.* **Dennis D. Horn,10b**

E17. *I oppose the environmentally damaging alternatives B&D.* **Louise Gnenflo, 25a**

E18. *I wish it known that I am strongly opposed to Alternatives B, D, and E.* **Robert F. Shanks, 34b**

E19. *TCWP strongly opposes the two alternatives, B and D, that are identified as having "substantially more potential for adverse environmental effects" and that would alter substantial areas through inundation and associated damages.*

- *Alternative B, construction of a 3,600-acre reservoir on Fountain Creek, would consume at least 3,600 acres (800 to be acquired plus 2,800 already in public ownership). It would also be by far the costliest alternative, estimated at $50 million.*

Liane B. Russell, for the Tennessee Citizens for Wilderness Planning Board of Directors, 30b

Response to Comments E16 - E19: Comments noted.

E20. *I was raised on Fountain Creek in my early years and the water there, when it gets dry, won't support a dam. Now this last summer on each Sunday, . . . after church I go over and check the water as it goes into Duck River and Fountain Creek would go through a 4-inch pipe at natural flow. There was no pressure at it's lowest stage before the first rain came.* **Glenn Stevenson, 78a**

Response to Comment E20: Available information indicates that a reservoir in the Fountain Creek watershed similar to that evaluated under Alternative B would receive enough rainfall during even a drought period to meet the projected needs of the Columbia area through 2050.

E21. [T]*here are concerns with the Fountain Creek Proposal . . . . Water quality issues are the main concern with the Fountain Creek Reservoir proposal. The Division is concerned that the iron and manganese levels and aquatic growth will cause a water quality issue for the customers of the Columbia Water System.* **W. David Draughon, Jr., Division of Water Supply, TDEC, 62c**

E22. *Impoundment of Fountain Creek would create a relatively small, shallow, nutrient rich reservoir. As a public water supply, such a reservoir may experience significant taste and odor problems. Fountain Creek Reservoir would provide ideal habitat for aquatic plants, algae, and phytoplankton. Seasonal oxygen depletion at depth would result in the build up of dissolved minerals including iron and manganese. In addition to loss of the relatively diverse community of fish and aquatic life currently supported by Fountain Creek, an impoundment may result in seriously degraded tailwater*

discharges. Oxygen depletion, elevated dissolved minerals, hydrogen sulfide, and significant fluctuations in flow, could contribute to water quality and habitat degradation in the tailwaters and the Duck River. When combined with anticipated loss of wetlands, Alternative B has potential for serious negative environmental consequences. **Abrey McKinney, Environmental Services Division, TWRA, 61a**

E23. *Page 147 indicates that the Fountain Creek watershed that would contain the reservoir proposed under Alternative B "...contains relatively high levels of nitrogen and phosphorus from natural sources as well as non-point sources." This page further states that "[t]hese levels of nutrients would be quite likely to support excessive algal growth in the upper layers of the reservoir." Page 149 similarly states that "...construction and use of the Fountain Creek water supply reservoir would create a relatively small, nutrient-rich reservoir which probably would have to be carefully monitored and the watershed strictly managed to protect the quality of the source water." Accordingly, EPA is concerned that the Fountain Creek Reservoir proposed under B could become eutrophic and not comply with the Clean Water Act.* **EPA, 51s**

Response to Comments E21 - E23: The information available to TVA indicates that each of these water quality effects could occur. If Alternative B was implemented, each of these issues would have to be addressed to protect the water supply source and downstream uses of the Duck River.

E24. *Of the four presented action alternatives (B-E), EPA does not environmentally favor the construction of Fountain Creek Reservoir. This is due to the projected substantial loss of forested wetlands and uplands, potential ground-water effects due to local karstic geology, the potential for shoreline development and its associated impacts on water quality, the expectation for a small nutrient-rich reservoir with a slow flushing rate which may result in noncompliance with water quality standards associated with eutrophication, the potential for aquatic ecology effects downstream of the proposed dam due to reduced flows, the need to acquire an additional 800 acres of land, the uncertainty of the undocumented impacts of the new water treatment plant and associated five-mile long pipeline, and the existence of two nearby reservoirs (Normandy and Tims Ford) which might be utilized.* **EPA, 51k**

E25. *Of the four action alternatives, the Fountain Creek Reservoir (Action Alternative B) is the least favorable. This alternative will result in the greatest costs, both environmental and economic. The Draft EIS projects a net loss of 140 species, a loss of 200 acres of wetlands which would probably result in mitigation costs, a considerable expense for dam construction and the maintenance of long-term water quality in this reservoir, and the greatest negative impact on prime farmland and community noise. The projected benefit of additional water volume of 74cfs is contingent upon the function and capacity of this reservoir in an area that is characterized by karst geology and seldom has surface water in even mild drought conditions. While addressing the projected water needs for Maury and southern Williamson counties, the Fountain Creek reservoir may provide no benefit to residents of Marshall and Bedford counties.* **Leslie Colley, The Nature Conservancy of Tennessee, 44c**

Response to Comments E24 - E25: These comments summarize many of the potential adverse effects which could be associated with Alternative B. By way of clarification, the available information indicates that the stream-dwelling species which would be displaced by the reservoir also occur in many other streams in the adjacent part of the Duck River watershed.

E26. *I also object to damming Fountain Creek (Alternative B). Please consider the environmental impact and the cost effectiveness of the proposed alternatives. Short Springs and the Fountain Creek water shed deserve protection for future generations and most importantly, the diverse life present there.* **Kevin C. Fitch, 54b**

Response to Comment E26: Each action alternative would have both benefits and adverse effects. The challenge in projects such as this is to maximize as many of the benefits as possible while avoiding or minimizing the potential adverse effects.

E27. *Building Fountain Creek Reservoir is an expensive alternative, reminiscent of choices made in the '60s and '70s. TVA and its stakeholders will do well to learn from previous experience and save itself and the taxpayer's dollars by choosing another scenario. This area of Fountain Creek is not suited to a reservoir because of the shallow water depth. As noted in the draft EIS, the Fountain Creek Reservoir will be a shallow, nutrient rich reservoir. By definition, we believe it will provide a poor water supply and poor aquatic habitat. It also has a potential for creating more public expectation and suffering the same sociological conflicts over resources presently experienced on TVA's Nickajack, Chickamauga and Guntersville reservoirs. These were unintended consequences in those areas. Neither TVA, the state, or county governments can afford the cost of managing the natural resource conflicts and it would be inexcusable to knowingly create them. Further, building the reservoir will cause biological loss and maintaining it under low dissolved oxygen and low flow circumstances will likely to continue this trend.* **Marty Marina, Executive Director, Tennessee Conservation League, 58g**

E28. *I feel that the Fountain Creek option should be given the lowest priority ranking of the five options. The capital cost (given the actual water demand) is excessive. The project is essentially "overkill", and the amount of environmental/ social destruction is therefore unwarranted. The operational costs will also be exorbitant, given the regional attitude to develop every water body as a luxury golf course development. The best the locals could hope for would be a Radnor Lake scenario.* **Richard E. Lockwood, 31b**

E29. *The Fountain Creek Dam Alternative is fraught with both opportunity and limitations. This alternative appears to provide an adequate water supply. The Columbia Dam land use EIS, associated deed restrictions and agency agreements provide for environmental mitigation. Other permit issues must be resolved before project approval. Moreover, reservoir's shallow nature creates challenges for water quality. In no event, however, should the Fountain Creek Dam alternative be abandoned until provisions have been made for an adequate water supply through 2050.* **Justin P. Wilson, Deputy to the Governor,43d**

Response to Comments E27 - E29: These comments highlight the serious, long-term considerations which will have to be carefully evaluated before a decision is made concerning this alternative. All of the potential adverse effects would have to be resolved or substantially overshadowed by the expected benefits before this alternative should be built.

E30. *The land currently reserved for alternative "B" (Fountain Creek) should be retained in that status for the foreseeable future. TWRA would be allowed to operate the land area with a ban on any permanent structures. This would remain a possible impoundment area.* **Douglas K. Mitchener, 59g**

E31. *All land presently owned by TVA/ State of Tennessee shall be managed by TWRA. None should be sold to the public or be allowed to be squandered by our local govts* [governments ?]. *This 12,600 acres will be a jewel of this area if left whole and not systematically sold or developed. Our local govts and agencies cannot handle owning any of this land. They will turn it into trailer parks. The people that gave it up and our next generation deserve better.* **Mike D. Penrod, 67b**

Response to Comments E30 - E31: At present, the federal land in the Fountain Creek watershed is proposed to be transferred to the State of Tennessee with restrictions on its use that were described under the preferred alternative in the 1999 Land Use EIS. Those restrictions would exclude many kinds of activities on the land and maintain the possibility of building a water supply reservoir in the Fountain Creek watershed until 2050 or when a decision was made not to build such a reservoir.

E32. [W]*e recognize that the Fountain Creek Reservoir would apparently become part of the TVA system and would therefore be managed by TVA, which has demonstrated significant expertise and success in reservoir management.* **EPA, 51l**

Response to Comment E32: Information presented in Section 1.3 and 3.2 indicates that TVA is not proposing to design or construct any of these alternatives. While any reservoir built in the Fountain Creek basin would be within the Tennessee River watershed, TVA is not planning to manage such a project.

E33. *The Fountain Creek proposal is costly, of high environmental and landowner impact, and has risk of failure for the same reasons Columbia Reservoir Project failed.* **John M. Procter, Elk/Duck River Chapter, Trout Unlimited, 60b**

Response to Comment E33: The EIS identifies all of the known issues which would need to be evaluated before a decision is made to construct any additional water supply project(s). Both the EIS and many of the comments on that document highlight issues about a possible reservoir which would have to be addressed before such a project should be built.

E34. *Before you get too excited about any one of these alternatives, take a good look at the people who are going to have to give up their homes and their farms. We've done it once, it didn't work. Fool me once, shame on you; fool me twice, shame on me. And he who would ignore history is doomed to repeat it. Please dear God, let there be a wise head in this crowd. Don't do it again.* **Carolyn Derryberry, 74c**

E35. *There needs to be somebody to check this out to see if the environmentalists are going to let you build* [a dam] *before you go out there and start taking land like you did before. They got the cart before the horse the last time and they went out there and started taking land and then they found out they couldn't complete it. The blame was laid on Congress. They said Congress gave them the money and told them to do it and that's the reason it was done. The three Judges we stood before in Cincinnati told our lawyers that we needed to take this to Congress and it's their job to straighten it up and that's where it's at today, in Congress.* **William Derryberry, 73c**

Response to Comments E34 - E35: All of the important issues associated with building and operating this reservoir should be resolved before any action is taken to move people off of their land. TVA and the other cooperating agencies are very much aware of the anguish many people in the Columbia area feel about the loss of their land for a reservoir project that was never built.

E36. *Very little has been said about the recreational advantages this project offers. Our city and county elected officials have made the county a recreation center and are attempting to do more at the present time with the land that has been purchased by TVA. The people are paying 5 cents per 1000 gallons of water used. The Fountain Creek Reservoir is a part of the Columbia Dam project. So lets finish a part of the Columbia Dam Project.* **Ralph G. Maddux, 23b**

E37. [T]*he average depth* [of a Fountain Creek Reservoir] *would only be 19 feet. I don't know about you but I see a few sportsmen out here, 19 feet would be some pretty good fishing, especially for some Crappie and Brim and that's what I enjoy fishing for. We didn't talk about the recreational uses. There will be recreational uses for Fountain Creek.* **Wayne Romesberg, 72h**

Response to Comments E36 - E37: As described in the Land Use EIS, the recreation benefits that were part of the Columbia Dam Project are now proposed to be met in the future uses of the land along the Duck River. As described in Section 3.4, the purpose of Alternative B would be water supply. Also as described in Sections 5.4 and 5.11, recreational and other uses of the reservoir probably would have to be substantially restricted to protect the quality of that water supply.

E38. *The cost, I'm not sure about the dollar figures I've seen tonight because I don't know if we are talking about today's dollars or tomorrow's dollars. If it's tomorrow's dollars, I would say you are way out of line.* **Randy Short, 80c**

E39. [T]*he . . . approximate $50M cost* [of a Fountain Creek Reservoir]*, it was also put in that could be plus or minus 30%. Well that means if we watch our construction cost, this dam could be completed for as little as $35M if we pinch pennies. If we don't pinch pennies, it could $65M. I also noticed when we talked about the pipelines, we never did say if that was going to be plus or minus 30%, Being that it was not said, I am going to assume that it wasn't so when we are looking at possibly a $35M versus some of these $11M and $18M alternatives, hey we are in the neighborhood.* **Wayne Romesberg, 72i**

Response to Comments E38 - E39: The "order of magnitude" cost estimates included in the EIS have a wide accuracy range ($\pm$ 30 percent) and were presented only to help compare the alternatives. The present (Year 2000) cost estimates would be refined considerably as details of the project(s) were identified.

E40. [I]*f we do decide to go with Alternative B, what we need to do is make a solid commitment behind it, no bailing out from pressures of any group. I don't know if TVA will even have anything to do with it, but if they do, I would like to make sure that TVA does fight for Fountain Creek like they did fight for Tellico years ago because when they fought for Tellico, they won all the way to the Supreme Court.* **Wayne Romesberg, 72k**

Response to Comment E40: Federal and state agencies can evaluate future water needs on a regional scale, identify conceptual options, and conduct generic evaluations of those options. Meeting the day-to-day water needs of the Columbia area will require the leadership and cooperation of local agencies and officials. TVA itself is not planning to build or operate a reservoir on Fountain Creek.

E41. *I think that the Fountain Creek Dam would probably do a lot to settle a lot of emotions and a lot of the defeated attitudes around here, that finally somebody has a chance to do something right in this county if they can follow through.* **Sharon Vaughn, 79c**

Response to Comment E41: TVA also is very much aware that the Duck River Project has been "underway" for over 30 years and that most of the "activity" has been conflict between one group and another. Completing the last part of this project (identifying ways to meet the water needs) will allow everyone to close out this part of our history and focus on new opportunities.

E42. [T]*he Maury Alliance Board of Directors recommends that: a) work begin on the planning and financing of the Fountain Creek alternative in order to meet the timetable necessary to avert any potential water shortage issues, and b) TVA and the State of Tennessee support local and regional agencies in their pursuit of their collectively agreed upon best alternatives to water supply and wastewater disposal that benefit the community, its residents, and the quality of life in middle Tennessee.* **Frank M. Tamberrino, President, Maury Alliance, 47b**

Response to Comment E42: TVA has prepared this EIS to help everyone in the upper Duck River basin understand the alternatives that are available to meet future water needs and the potential effects those alternatives could have on the area. Now, local water supply agencies have to consider all of the available information, develop detailed plans for likely alternatives, and gain public support for those projects.

F. Alternative C - Downstream Water Intake

F1. *Please opt for the river mile 100 intake alternative.* **P. F. Clemens, 22**

F2. *I have looked over the alternatives proposed, the one outlining a downstream intake for Columbia appears to be the least damaging and also the least expensive.* **Jeff Stewart, 52b**

F3. *Of the four alternatives presented, "Alternative C Downstream water Intake", provides the most water in cubic feet per second for the least cost and has the least potential for adverse environmental effects.* **Marjorie S. Collier, President, Friends of Short Springs, 27e**

F4. *After studying the Draft EIS, Executive Summary, of the Future Water Supply Needs in the Upper Duck River Basin, and consulting respected knowledgeable individuals concerning the potential impact of the alternative proposals to address such needs, I have concluded that Alternative C would be in the best long run interests of area residents. Please, then, show that I favor Alternative C.* **Robert F. Shanks, 34a**

F5. *As a lifelong resident and owner of river bottoms and banks along the Duck River below Normandy Dam, I would like to ask support from TVA for Alternative C (Downstream Water Intake) in what would seem to be the most practical and least objectionable answer to providing more water for Columbia and other downstream communities.* **Polly Dement Oettinger, 41a**

F6. *Of the options listed for assuming a water supply for Maury/ Williamson counties in the Upper Duck River Basin, I believe the Duck River Interface Conduit at mile 100 plan is the one to implement and I cast my vote in its favor. We need to use and conserve our water reservoir carefully and I appreciate TVA's efforts to do so.* **Henry Lewis, 21**

F7. *Of all the solutions offered, it appears that the only logical path is the "Duck River Intake Conduit" at river mile 100. This would provide the longest supply for the best price and would avoid doing harm to the Short Springs State Natural Area. The State Natural Area was declared after many years of work and study. It is a place of natural beauty to be preserved as the town and county continue to grow.* **Angela B. Arnold, 19**

F8. *Of the five alternatives presented to supply the water needs of the Upper Duck River Basin, Alternative C (Downstream Water Intake) is the preferred alternative. This alternative is the most cost effective. In terms of cost per cubic foot of water supplied, Alternative C is the lowest cost by over a factor of two! Alternative C will also provide the required water needed through the year 2050. . . . . Alternative C is the only alternative that meets the water needs at a reasonable cost and is not detrimental to the environment.* **Dennis D. Horn, 10a**

F9. *After an open discussion, we unanimously agreed that the Downstream Water Intake is the least objectionable proposal . . . . for the benefit of the Elk and Duck River tailwaters. Additionally it is the least disturbing for communities in the Duck River basin outside the need area of Columbia. The EIS was very thorough, and although it lacks in specific detail regarding issues important to preserving cold water fisheries, there is plenty of information to conclude this best option. Second lowest cost, least*

environmental impact, proximity to need (Columbia), shortest pipeline, sufficient cfs increase to satisfy 2050 projections, all clearly support this option. There is little water need downstream of Columbia, so it seems most just for Columbia to draw water closer to home and without impacting a larger population outside this need area upstream. **John M. Procter, Elk/Duck River Chapter, Trout Unlimited, 60a**

Response to Comments F1 - F9: Comments noted. Present information concerning the effects of each alternative are discussed in Chapter 5 and are summarized in Section 3.9.

F10. *I support one of the pipeline alternative (C&E) with C probably being superior to E.* **Louise Gnenflo, 25b**

F11. *Alternatives C and E, respectively, will provide the most cost effective results, will provide longer-term results, and are the least destructive to the environment.* **Kevin C. Fitch, 54c**

F12. *There are two alternatives, C and E, that would cause less land disturbance and have far less potential for adverse environmental effects. Of these, Alternative C supplies more water, requires a shorter pipeline, and is less costly than Alternative E (Tims Ford pipeline). For these reasons Tennessee Citizens for Wilderness Planning prefers Alternative [C]. If, however, other environmental considerations (e.g., significant habitat) should make Alternative E preferable, it would be acceptable to us.* **Liane B. Russell, for the Tennessee Citizens for Wilderness Planning Board of Directors, 30d**

F13. *Action Alternatives C and E (the Downstream Water Intake and the Tims Ford Pipeline, respectively) present solutions that The Nature Conservancy believes are more positive and balanced. Both of these alternatives have lower projected environmental impacts than Alternatives B and D and are an order of magnitude less expensive than the Fountain Creek reservoir. An intake below Columbia at Duck River Mile 104 would meet projected needs for Maury and southern Williamson counties but does not address potential water needs in Marshall and Bedford counties, particularly if population growth in these counties exceeds projections. . . . . Concerns that surround Alternatives C and E include construction of the pipeline, placement of the discharge point, increased erosion and turbidity, alteration of water temperature, and transfer of species. However, these concerns would ultimately be addressed during the design and implementation process.* **Leslie Colley, The Nature Conservancy of Tennessee, 44f**

F14. *This letter is in opposition to all the alternatives proposed in your Draft Environmental Impact Statement on the Future Water Supply Needs in the Upper Duck River Basin. We regard the proposed alternatives as a highly undesirable course of action for several reasons.* [Comments are provided in several subject areas] *However, if any of the proposed alternatives must be chosen, we support Alternative C: Downstream Water Intake.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33a**

Response to Comments F10 - F14: Comments noted.

F15. *Additional consideration of low-flow impacts from implementation of Alternative C, the pipeline to downstream reaches of the Duck River, should be further evaluated and discussed. All impacts should be weighed and assessed to contrast each alternative fully.* **Justin P. Wilson, Deputy to the Governor,43h**

F16. *It is difficult to assess the impact of this alternative without having solid information on future cumulative withdrawal demands on the Duck River, including direct industrial and agricultural use. As the percentage of Duck River low flow comprised of treated wastewater increases, there is a corresponding increase in the vulnerability of Duck River fish and aquatic life to pollution episodes. The potential adverse impacts of this alternative during periods of extended low flow should be further explored.* **Abrey McKinney, Environmental Services Division, TWRA, 61b**

F17. *Taking water from downstream of the Columbia discharge needs more information before it can be a viable choice. This EIS does not consider construction or low-flow impacts to ground water, surface water, aquatic life, terrestrial life, or endangered species. Further it does not address consequences to the supply or biological life from continuously recycling water so close to the outflow pipe. What will be the attendant cost of wastewater and freshwater treatment or biological loss?* **Marty Marina, Executive Director, Tennessee Conservation League, 58h**

Response to Comments F15 - F17: The information presented in Section 3.9 summarizes and compares what is known about the potential effects of each alternative on the environment. As indicated there and in the more detailed discussions presented in Chapter 5, the present concept of this alternative would not reduce the flow downstream from the new intake below 100 cfs or substantially degrade the quality of aquatic habitat conditions in that area, but would offset or augment the flow and habitat conditions in the river downstream from the present Columbia water intake. As with each of the other alternatives, the likely effects of Alternative C would have to be confirmed and updated as the specific details of the project(s) were developed.

F18. [T]*here are concerns with . . . pumping water from below Columbia back to the water treatment plant. If water is to be pumped from below Columbia back to the plant, it is suggested that the discharge be into the Duck River below the intake. This would provide the additional water to meet the low flow conditions established for the Duck River while allowing Columbia to withdraw more water from the Duck at the current intake location. The Division is not receptive to the idea of using this returned water in the intake.* **W. David Draughon, Jr., Division of Water Supply, TDEC, 62d**

Response to Comment F18: This suggestion is a subject which local agencies may want to consider if they choose to pursue some form of Alternative C. As indicated in Sections 3.10 and 5.4, the existing treatment plant in Columbia does not have the capacity to treat all of the water that is projected to be needed starting some time after 2015. If additional space for expansion of the water treatment plant becomes available in Columbia, local interests might consider withdrawing all of the needed water through the existing intake and, when necessary, augmenting the flow in the river using water withdrawn some distance downstream. Alternative approaches already mentioned in the description of Alternative C in Section 3.5 include treating water from a downstream intake closer to the source or closer to customers living in that part of the service area. As indicated in Section 5.4, the water in the Duck River near River Mile 100 presently meets all applicable water quality criteria and is classified for domestic water supply use. Especially if all appropriate source water protection measures were followed, TVA sees no reason why a municipal water supply intake could not be located in that part of the river.

F19. *Alternative C is Cathy's Creek Pumping Station. I don't believe this is an acceptable alternative because I don't know about you all but I don't think the idea of drinking my own sewer water is acceptable. I understand the people in California have been doing that for years and we see some of the problems they have.* **Wayne Romesberg, 72c**

Response to Comment F19: Water is a finite resource that we all use, treat, and recycle on a daily basis. In fact, some water used in Columbia has passed through both the Shelbyville and Lewisburg wastewater treatment plants before it was withdrawn from the river. Standard treatment methods are adequate to ensure that this common practice poses no risks to human health.

F20. *I don't know whether the thing that Mr. Jacobs just talked about* [Tims Ford Pipeline] *is the best or not. I feel like you start at the head of a stream when you want to get some water and I feel like we're going to do just like he said, leave Marshall County and Bedford County out if we go down below Columbia and start pumping water back up here. We let it get by us, maybe we just need to stop it somewhere.* **Jack Craig, 77b**

Response to Comment F20: Comment noted.

F21. *Alternative "C" could be implemented at a later date and put into service in approximately 30 months.* **Douglas K. Mitchener, 59f**

Response to Comment F21: TVA has not attempted to estimate the construction time associated with any of the action alternatives. The length of the construction period would depend on the size and type of any new water treatment plant and the lengths of any new supply lines and/or new distribution lines which would be included in the project. Pipelines can be built in just a few months; other facilities often take substantially longer.

G. Alternative D - Raise Normandy Pool Level

G1. *The Division believes the Normandy Dam proposal will help ensure the needs of the area until 2050 and is not opposed to this alternative.* **W. David Draughon, Jr., Division of Water Supply, TDEC, 62b**

G2. *The League has investigated the choices and believes raising Normandy Dam to be the optimal choice. . . . . As usual, we look forward to supporting TVA in creating a well-balanced solution to this issue.* **Marty Marina, Executive Director, Tennessee Conservation League, 58a**

G3. *Raising the Normandy pool level has a moderate cost and the best chance of answering short and mid-term supply, with minimal biological or sociological impacts. While there will be some short-term loss, this alternative seems to accommodate management of the State Natural Area for its intended purpose and other habitat concerns at the reservoir. It will also improve present habitat conditions on the Duck.* **Marty Marina, Executive Director, Tennessee Conservation League, 58i**

Response to Comments G1 - G3: Comments noted.

G4. *I feel that the highest priority ranking should be given to the Raise Normandy Dam option, but with serious reconsideration of a water conservation method in the Columbia area* [including the use of cisterns]. **Richard E. Lockwood, 31c**

Response to Comment G4: The use of cisterns could be one way of conserving water in the Columbia area under this or any of the other alternatives.

G5. *As far as the Normandy Dam, that would be fine to raise it as high as you could go but that is going to be hard to do with those people up there.* **Glenn Stevenson, 78c**

G6. [I]*f you raise the dam up at Normandy five feet, you are going to cover up some more land; you're going to dislocate some more people; you're going to have all kind of problems.* **Ed Jacobs, 76d**

Response to Comments G5 and G6: As indicated in Section 5.10, all of the land which would be affected by raising the Normandy pool five feet is already owned by the federal government; no private land would be required to complete that project as it is presently defined.

G7. *We recommend the Final EIS attempt to more fully predict the impact Alternative D would have on water quality in both the reservoir and Normandy tailwaters. Of particular interest is the quality of water available for tailwater release and as provided to TWRA's Normandy Fish Hatchery. This alternative may well improve the quality and quantity of tailwater releases, providing a significant environmental benefit to the Duck River while resolving the water supply issue.* **Abrey McKinney, Environmental Services Division, TWRA, 61c**

Response to Comment G7: Section 5.4 presents the results of a careful evaluation of the possible effects of this conceptual alternative on both the water quality in Normandy Reservoir and in the Duck River downstream from Normandy Dam. If this project was proposed to be built, these results would be confirmed or refined during an evaluation using the detailed construction and operational plans that would have been developed.

G8. *The Friends of Short Springs . . . . are strongly opposed to Alternative D, "Raising Normandy Pool Level 5 Feet"* **Marjorie S. Collier, President, Friends of Short Springs, 27a**

G9. *Action Alternative D (raising the pool level of Normandy Lake) would not meet projected needs beyond 2035 and is second only to impounding Fountain Creek in potential negative environmental impacts.* **Leslie Colley, The Nature Conservancy of Tennessee, 44d**

G10. *I oppose the environmentally damaging alternatives B&D.* **Louise Gnenflo, 25c**

G11. *Cities upstream from Columbia are not interested in Columbia's future and will oppose alternatives "D" and "E".* **Douglas K. Mitchener, 59c**

G12. *I also wish it known that I am strongly opposed to Alternatives B, D, and E.* **Robert F. Shanks, 34c**

Response to Comments G8 - G12: Comments noted.

G13. *I certainly do think it is advisable to do this planning and be concerned about future water demands but I think we need to take into account the affect on the environment and economics of the situation and make the make* [?] *choice. Clearly, Normandy pool level raising should be ruled out.* **Marjorie Collier, 75b**

G14. *I am opposed to Alternative D (Raise Normandy Lake Level) on the basis of cost and habitat destruction. . . . I am opposed to Alternative [D] (Raise Normandy Lake Level) because that would be detrimental to the Short Springs State Natural Area. This alternative will not satisfy the water needs through the year 2050. Alternative D is not the most cost effective option.* **Dennis D. Horn, 10c**

G15. *This correspondence is to register my opposition to the proposed alternative to "Raise the pool level on Normandy Reservoir." If implemented, this action would destroy the richest and most environmentally valuable part of the Short Springs State Natural Area lying downstream of Machine Falls and along Bobo Creek. This is more environmentally damaging than other available alternatives and provides only a short term solution to Columbia's water needs.* **J. P. Christopher, 42**

G16. *I am writing regarding the possibility of flooding of the Short Spring Natural area to provide water for Columbia, Tennessee or another area. The lower portion is a beautiful area for wild flowers, some of which are native to that area only. Much work has been done to make this area accessible to groups to hike and enjoy one of God's many gifts. I would like to go on record in strong opposition to raising Normandy Dam (Alternative D). It would be complete destruction of a natural area which violates the Act of 1971, Natural Areas Preservation.* **Agnes Miller Smedley, 46**

G17. *I am writing to urge TVA not to raise the Normandy Lake level five feet for the purposes of providing additional water to the Columbia, TN area (Alternative D). . . . . Please consider the environmental impact and the cost effectiveness of the proposed alternatives. Short Springs and the Fountain Creek watershed deserve protection for future generations and, most importantly, the diverse life present there.* **Kevin C. Fitch, 54a**

G18. *My understanding is that if the Normandy dam is raised, Short Springs will be* [?] *about five feet. Short Springs consists of two small ravines, and raising the water level five feet will flood the bottom land where most of the wildflowers are. It will flood out the trails that lead to Machine Falls and wander along Bobo creek. Because of the steepness of the slopes, new trails above the waterline will be impractical. Most of the spring water in the area appears just prior to the two main creeks entering Normandy lake. Raising the lake will effectively submerge a couple of large springs on Bobo creek and will reduce the 'dean' spring water exposure from Machine Falls to just a few feet. In addition, all of the flotsam and jetsam associated with lake coves will inundate the Short Springs area and greatly affect its beauty.* **Jeff Stewart, 52a**

G19. *TCWP strongly opposes the two alternatives, B and D, that are identified as having "substantially more potential for adverse environmental effects" and that would alter substantial areas through inundation and associated damages.*

- *Alternative D, raising the height of Normandy Dam, and the pool level of Normandy Reservoir, by 5 feet, would, (a) have disastrous effects on prime wildflower habitat in the 420-acre Short Springs State Natural Area NE of Tullahoma, and (b) flood a 60-acre TVA Small Wild Area adjacent to the Natural Area. Further, this is the only Alternative that fails to meet the water-supply objective. Thus, the additional water volume supplied by Alternative D is only 16 cfs (instead of the 22 cfs minimum objective), and the water needs would be met only through the year 2035 (instead of through 2050).*

Liane B. Russell, for the Tennessee Citizens for Wilderness Planning Board of Directors, 30c

G20. *I'm Marjorie Collier; I'm from Tullahoma; I'm President of Friends of Short Springs, which is a support group for Short Springs state natural area, which is located in the city limits of Tullahoma in Coffee County and lies adjacent and part of it's along the Normandy impoundment. We object very strongly to the option of raising the Normandy pool level five feet. Our objections are fourfold:*

- *it is environmentally destructive of a state natural area. It would come up over the lower part of the natural area where two creeks come together below a beautiful waterfall and has an outstanding group of wildflowers in that area. It's very rich. The state of Tennessee designated the area as a designated state natural area under the Natural Area Preservations Act and, at that time,*
- *it would be illegal, frankly, to come up and inundate, raise that level five feet onto that natural area. Not only environmentally destructive but really illegal to do that to a designated natural area. TVA set aside 60 acres along the Normandy impoundment as a small wild area and, when the state made it a designated state natural area, that 60 acres became part of it.*
- *it's not the most economical alternative. The cost of getting water downstream from Columbia is half the cost of the Normandy alternative and the downstream alternative is also much less environmentally damaging than the Normandy alternative.*
- *The fourth objection we have is that the Normandy alternative would not meet projected future demands beyond the year 2035 and the other three will meet the projected future demand up to year 2050 or even later than 2050.*

Marjorie Collier, 75a

G21. *Under Alternative D, the suggested maximum pool of Normandy Lake would be raised from 875 feet to 880 feet. Alternative D would flood portions of Short Springs*

Designated State Natural Area along Bobo Creek at contours below 880 feet during the normal maximum pool elevation of the reservoir. The bottom-land habitat receives seasonal inundation. By raising the lake level there would be prolonged periods of occasional inundation as well as longer periods of more permanent flooding of the habitat. We would expect this habitat and associated biological diversity to change community type and floristic composition along with the associated forest habitat. The forest type is a high quality mesic area with rich displays of spring wildflowers along Normandy Lake between the 875 and 880-foot contours. These areas could be impacted by inundation under Alternative D and could significantly impact the natural area through the destruction of the flora and fauna depending upon the timing and duration of inundation. This impact is cited in table 7 on page 63; however, it is not mentioned in the impacts described under Alternative D pages 48 - 56. The environmental impact of flooding the bottomland riparian forest could be a violation of Natural Resources Areas Rules, {TCA Section, 0400-2-8-.08 Intrusions, 0400-2-8-.22 Water Level Control} and may require additional Departmental permits for wetland impacts. **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64l**

Response to Comments G13 - G21: Comments noted. The potential significant adverse effects of this alternative on part of the Short Springs Natural Area are presented in Section 5.11 and are summarized in Section 3.9. If the pool level of Normandy Reservoir was to be raised, appropriate measures should be included in the project to avoid or mitigate those adverse effects on this Natural Area.

G22. *Raising Normandy Dam has additional benefits independent of the water needs identified in this study.* **Justin P. Wilson, Deputy to the Governor,43f**

Response to Comment G22: The focus of this EIS is on meeting future water supply needs. If Alternative D was proposed to be built, the detailed plans for and evaluation of that project should include all of the benefits and potential adverse effects which could occur. Local planners probably would appreciate input from state agencies on the possible benefits of this project, as well as state agency perspectives on its possible adverse effects.

G23. [Under Alternative D,] *An increase in shoreline erosion associated with additional access to Federal lands, encouraged by the proposed raising of water levels, could result directly in an increase in water pollution (especially sedimentation). The Draft EIS does not provide documentation for adequate protection of natural resources that could result in net losses of the State's biological and natural resources as well as increases in shoreline erosion. Perhaps TVA could suggest shoreline management strategies that would be implemented to protect natural resources and biodiversity if this alternative were selected.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64o**

G24. [T]*he proposed Alternative D could increase shoreline erosion, decrease water quality, reduce aquatic habitat, manipulate and significantly reduce forested and riparian habitat, and reduce contiguous forested tracts (communities) simply as a result of prolonged inundation by sustained higher lake levels. We suggest that TVA fully document these losses and compare them to anticipated habitat improvements associated with increasing the lake shoreline area by raising the lake levels. Managed shorelines, with increased efforts toward restoring habitat (particularly by erosion control through bioengineering techniques), are paramount to long term water quality improvements and protection of the State's rare, threatened or endangered species. By*

utilizing specific reservoir-wide management strategies throughout Normandy Lake, TVA could demonstrate habitat improvements associated by raising the lake levels with increasing the lake shoreline area. Additional documentation is needed to outline steps that will be taken by TVA to protect the current recreational uses and diverse habitat along the shoreline. **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64p**

Response to Comments G23 and G24: If this alternative is proposed to be built, the detailed evaluation of possible effects on the environment would need to include a wide variety of subject areas, probably including all of the issues mentioned in these comments. As indicated in Section 3.6, all of the work on this project would be conducted using appropriate methods to minimize construction impacts and to comply with pertinent NPDES permits. Operation of the enlarged project probably would include measures to maximize recreational and other benefits around the reservoir and to avoid or minimize adverse effects to natural resources in the area.

H. Alternative E - Tims Ford Pipeline

H1. *I support one of the pipeline alternative (C&E) with C probably being superior to E.* **Louise Gnenflo, 25d**

H2. *Based on information provided by the EIS, the Tennessee Department of Environment and Conservation's Division of Water Supply states that the Tim's Ford pipeline alternative provides the highest quantity and quality water. This alternative may also provide benefits to other communities along its route who face increasing water needs.* **Justin P. Wilson, Deputy to the Governor,43e**

H3. *After careful review of the alternatives discussed, the Division of Water Supply is of the opinion that the Tims Ford alternative is the best alternative for meeting the water supply needs of the Columbia area. Tims Ford Lake has the best water quality of any of the alternatives presented. It also has the quantity available to supply the 2050 demand in Columbia. An added benefit is that it could be designed to help with any underestimation of water demand in the Shelbyville/Lewisburg area. This is an alternative that adds additional water to this area.* **W. David Draughon, Jr., Division of Water Supply, TDEC, 62a**

H4. *As you have already heard, each plan has been discussed here, each one has pretty well been opposed, and the pros and cons on it. I won't try to get into arguing about which one and why you might have some complications, but the simplest thing that I see and, actually, I proposed it when we had out meeting here before about the pipeline. If you've ever been on Tims Ford, it's a big lake. It's got a lot of water and no doubt that water is not being used. They aren't letting it out and the reason I proposed the pipeline is real simple. As they have already told here tonight, you can run the pipeline down the road, and it will only have to be used two or three months out of the year. If you don't need it, you don't have to use it.* [It is] *one of the cheapest forms of answering our problems. . . . . With a pipeline, you're not bothering anybody. You're guaranteed you got the water - you know you got it. There's not any problem with it. So to me, I'd like to say that the pipeline is the simplest, the best, and the most economical to operate, . . . and it's got the best future for it too without creating any problems.* **Ed Jacobs, 76b**

Response to Comments H1 - H4: Comments noted.

H5. *Action Alternatives C and E (the Downstream Water Intake and the Tims Ford Pipeline, respectively) present solutions that The Nature Conservancy believes are more positive and balanced. Both of these alternatives have lower projected environmental impacts than Alternatives B and D and are an order of magnitude less expensive than the Fountain Creek reservoir. . . . Alternative E, the Tims Ford pipeline, also has a lesser degree of environmental impacts, while still meeting projected needs through 2050. In fact, this pipeline would increase flow across a wider region, maximizing benefits to the most residents and to aquatic life. Concerns that surround Alternatives C and E include construction of the pipeline, placement of the discharge point, increased erosion and turbidity, alteration of water temperature, and transfer of species. However, these concerns would ultimately be addressed during the design and implementation process.* **Leslie Colley, The Nature Conservancy of Tennessee, 44g**

Response to Comment H5: As noted in this comment and in the EIS, if this alternative was proposed to be built the detailed planning and subsequent evaluation would include an more-detailed evaluation of potential adverse effects on the environment.

H6. *I wish it known that I am strongly opposed to Alternatives B, D, and E.* **Robert F. Shanks, 34d**

H7. *I have read the proposals for supplying water to Columbia via accessing water from Tims Ford Lake (Alternative E) and as a long term home owner on the lake. I oppose this measure, as do my neighbors in the Highland Ridge subdivision of Estill Springs.* **Tom Willingham, 17**

H8. *[I have] lived on Big and Little Duck. [I am] opposed to proposed Tim's Ford water line and think it is a disgrace that so much money has been spent on Columbia.* **J. D. Spencer, 14**

H9. *TVA has done much to improve the quality of life in the Southeast for which we are grateful. Alternative E, the proposal to divert Elk River water for the benefit of the few in a small area, would serve to diminish our overall quality of life. It might be one of the least expensive of the four proposals, but it is not one of the two best. It is the worst.* **Floyd and Linda Ayers, 32e**

Response to Comments H6 - H9: Comments noted.

H10. *The report is deficient in that it does not address effects on Tims Ford Reservoir should that option be elected; how much drawdown, etc.* **Jerry C. Lashlee, 26a**

H11. *Of the proposed plans, I would like to register my objection to Plan E, which will spoil the pristine setting and environment of Tim's Ford lake which the former controlling agency TERDA and TVA has worked so hard to ensure over the years. It is not worth sacrificing this area to support growth in Columbia, TN.* **Lane and Tom Willingham, 18**

H12. *I am appalled at TVA's consideration of pumping water out of Tims Ford Reservoir to satisfy the Duck River Basin water supply demand. Tims Ford does not have enough water coming in now to properly flush the system and alleviate the poor dissolved oxygen problem. The water quality in this lake is continually deteriorating; your proposal would only aggravate this problem.* **Don F. Lee, 6a**

H13. *I do not like the idea of pumping water out of Tims Ford lake for Columbia, TN. It would greatly damage the ecology of our water. I certainly do not like this water being replaced with Tullahoma sewer water. We have a beautiful lake and we should not do anything that would hurt the quality of water we now have. It's bad enough having the city of Winchester empty their sewer water into the lake.* **Kay & Ron Hall, 50**

H14. *As a property owner at Tims Ford lake, I should like to strongly urge that pumping water out of Tims Ford NOT be allowed for diversion into the Duck River. This would cause the water level in Tims Ford to drop and would impair the lake for recreational use. The water level is already too low at times. As a taxpayer, there are cheaper alternatives which would take care of Columbia's water needs. For instance, 8 million for the proposed Normandy elevation vs. 13 million for the proposed Tims Ford*

pumping project. We have been blessed with a wonderful asset in Tims Ford Lake. Let us not succumb to the temptation to imperil this treasure. **David L. Hudson, 38**

H15. *We [Tims Ford Council] are objecting to "Alternate E" of the proposed water-supply alternatives for the Duck River Basin. Any additional draw on the waters of Tims Ford will have a tremendous adverse effect on the attractiveness and recreational usability of this lake. This would be especially noticeable during hot, dry summers like we have had the past two years when TVA has used Tims Ford for power generation and downstream flow. As a consequence, lake levels have lowered considerably before the end of summer usage periods. Tims Ford Lake is of immense economic benefit to Franklin County and all of southern Middle Tennessee. We want to see this lake continue to be a valuable asset to the region and be maintained for the enjoyment of property owners and recreational users of the lake.* **Tims Ford Council, 3**

Response to Comments H10 - H15: Existing information, presented in Section 5.4, indicates that, even in a severe drought, use of this pipeline would draw Tims Ford Reservoir down just 7 or 8 inches more than would occur if this project were not in place. This additional reduction in the pool level would not be noticeable to most people and would not adversely affect the use of the reservoir. If this alternative was proposed to be built, the planning for this project would include a up-to-date, more-detailed evaluation of the potential effects on water levels in Tims Ford Reservoir.

H16. *As a landowner whose property borders on the Elk River in western Lincoln County, Tennessee, I am against ANY plan that involves transferring water resources out of the Elk River watershed. I believe such a plan would negatively affect low-water flows on the Elk River, seriously impacting the use of the river for irrigation and recreation.* **Ken McGarry, 13a**

H17. [As a] *Property owner on Tims Ford,* [I am] *concerned about water quality and failure to maintain minimum flow below dam.* [My impression is that] *flows for October are in the range of 64 to 75 rather than 80 cfs. Odor and clarity also are problems during low flow periods.* [I am concerned that] *Piping water* [to the Duck River] *will drop lake levels, impact dock owners, and affect fishing quality.* [I think the actual] *cost of building pipeline will be higher that what has been projected by the time it's planned and constructed.* **Bill Balsley, 45**

Response to Comments H16 and H17: The preliminary planning that has been done concerning this alternatives is based on the assumption that no changes would be made in the quantity or quality of the releases from Tims Ford Dam. If this alternative was proposed to be built, a more-detailed evaluation of this potential effect on water releases into the Elk River would be conducted using specific information about the details of the project.

H18. *Building a pipeline from the Tims Ford Reservoir to the Duck River will unnaturally favor a county outside the Tims Ford Reservoir and handicap counties within the reservoir as they struggle to meet their existing and current demands for clean and plentiful water. There will also be negative impacts to flora and fauna as the pipeline is constructed and maintained over the years.* **Marty Marina, Executive Director, Tennessee Conservation League, 58j**

H19. *It was with great disbelief & disgust that I learned of TVA's plan to build a pipeline to transfer water from Tims Ford Lake to the Duck River. This does not seem to be a solution but a contrivance to allow unlimited, unregulated & poorly planned development in the Duck River Basin. . . .TVA has been instrumental in advancing the southwest to a position of prominence and TVA should have the integrity to say enough is enough and discard this alternative.* **Robert N. Reed, 28a**

H20. *I disagree with the Alternative E, "Tims Ford Pipeline" because it is effectively "robbing Peter to pay Paul". Removing a portion of a valuable water resource from a viable and fast growing area could be very detrimental to the economic future of the Franklin County area. In conclusion, it would be an example of poor planning, in my view, to remove precious water resources from the Franklin County area without thorough considerations of the long term effects on this area.* **Mark H. Dudley, 24i**

H21. *Tims Ford pipeline would generate revenue, from the sale of water, for the repayment of debt obligations of concerns outside of the region, the Duck River Development Agency. (Page 4) These debt obligations were part of the original agreement covering* ***local participation*** *in the overall project. Again, "robbing Peter to pay Paul".* **Mark H. Dudley, 24b**

Response to Comments H18 - H21: This alternative would use water stored in Tims Ford Reservoir to meet drought-related needs in the Columbia area part of the Duck River basin. Water that would occasionally be used this way would, otherwise, be passed on down the Elk River. As indicated in Section 5.4 and 3.9, Tims Ford Reservoir is not expected to be adversely affected by this alternative; however if this project was proposed to be built, additional more-detailed analyses would be conducted to confirm or revise this conclusion. It should be noted that TVA is not proposing to build this project; rather, TVA and the cooperating agencies have simply identified it as one of several reasonable ways to meet the future water supply needs of the Columbia area.

H22. *How can you take water out of Elk River and* [away from] *the people in Athens, I don't believe they would like that.* **Glenn Stevenson, 78b**

H23. *Alternative E also proposed interbasin transfer of water from Tims Ford Reservoir to Duck Creek, with which there also could be some associated environmental issues.* **EPA, 51o**

H24. *Tims Ford and the Elk River are for the people Southern Middle Tennessee or, at least, in that watershed. There are several large towns already drawing on those water resources. Periods of drought are also felt here in the form of decreased summer pool level and minimum flow into the river; i.e., low level and brackish river water conditions. This will only be felt more should water be drawn off for the Duck River people.* **Jerry C. Lashlee, 26c**

H25. *TVA's proposal to steal water from Elk River and divert it to Duck River for the sake of real estate development in the Maury and Williamson County area is obscene. It demonstrates TVA's disrespect for our natural environment and for the people who inhabit the Elk River Valley. How can you glibly state that it would have only "short-term and minor effects" on Elk River when you are proposing to permanently reduce the flow of this river? How much Elk River water will be needed to support growth in the Duck River area during the following fifty years? The following one and two hundred years? This proposal totally ignores the needs of future generations in the Elk River Valley.* **Floyd and Linda Ayers, 32a**

H26. *I am strongly opposed to Alternative E, taking water from Tims Ford reservoir to supply the upper Duck river basin. I think this would establish a bad precedent, and lead to a situation such as exists at the present out west with the Colorado river. The growth potential for the Tims Ford area is very great, e.g., Nissan's plans to hire a thousand new employees at Decherd, which will bring at least five thousand new people to the area. In a few years, we may need the water worse than Franklin and Columbia.* **Eugene J. Sanders, 39a**

H27. *The pumping station from Tims Ford, I don't believe that's good. I do not like the idea of taking water from one river valley and pumping it to another river valley. It sets a precedent. What could happen in the future there, if someone wants to come into the Duck River valley, take water out of the Duck River valley, say pump it into the Harpeth River valley, or maybe even go back to the Elk. That's entirely possible. If we take this action, then we are setting a precedent. I don't believe this is good.* **Wayne Romesberg, 72e**

Response to Comments H22 - H27: As described in Section 3.7, this pipeline would be used only during drought conditions to meet critical needs in the Maury/southern Williamson County Water Service Area (excluding Franklin and other distant parts of Williamson County). The present concept of this project would not alter the discharge from Tims Ford Dam or reduce the pool level in Tims Ford Reservoir more than 7 or 8 inches, even during drought conditions. If this project was proposed to be built, detailed plans for the pipeline and its operation would have to be developed, details of the project would have to be evaluated further for environmental effects, and the public would have an opportunity to comment on the project and its potential effects. All of the issues identified in these comments should be evaluated and addressed during that process.

H28. *Cities upstream from Columbia are not interested in Columbia's future and will oppose alternatives "D" and "E".* **Douglas K. Mitchener, 59d**

Response to Comment H28: As indicated in many of the comments presented in Sections G and H of this Appendix, people have a variety of views about both of these alternatives, in addition to each of the others. Some of those views include reasons related to interests quite different from providing water to the Columbia area.

H29. *Why not use 36" pipeline from Tim's Ford instead of 30". Cost difference is negligible and this could allow for more water to meet needs further into the future.* **Mike D. Penrod, 67a**

H30. *The pipeline length could be reduced by 50% if the north end terminated on a Flat Creek tributary having maximum natural flow equal to the pipelines capacity. The benefits of having more and better water at the Shelbyville intake may not be worth the extra cost of 10 more miles of pipeline. this would provide only an occasional benefit during drought conditions for Shelbyville. I would prefer to see Flat Creek never run dry.* **Fred H. Horn, 5**

Response to Comments H29 and H30: The present concept of this alternative includes features designed to meet the projected need for water through 2050. While a variety of other features could be included in this project, each of them also could add potential adverse effects at one or both ends of the pipe, wherever the pipeline might start or end. All components of the full project should be evaluated in detail before this, or any other, water supply project is proposed to be built.

H31. *I am not opposed to Alternative E (Tims Ford Pipeline), but that option is more expensive, both in actual cost and in cost per cubic foot of water supplied, than Alternative C.* **Dennis D. Horn,10d**

Response to Comment H31: The present order of magnitude cost estimate indicates this is likely to be true. If the decision about which alternative should be built comes down to cost, the present construction estimates would have to be refined and operational costs would have to be determined before that cost comparison is completed.

I. Climate, Geology, and Soils

I1. *EPA is concerned over the apparent lack of geotechnical studies in the document to determine the suitability of the site soils to hold water relative to the reservoir alternative (B). Local soils should ideally be relatively impermeable in order to retain desired water levels without creating zones of saturated soils adjacent to the project. Leakage and erosion of the proposed earthen dam are also a concern. The FEIS should contain estimates of impacts of water loss through the permeable parent soil materials that will make up the basin of the proposed reservoir.* **EPA, 51z**

Response to Comment I1: A foundation feasibility study for a possible reservoir in the Fountain Creek watershed was performed by the U.S. Army Corps of Engineers in 1997. This study provided information used in the description of Alternative B presented in Section 3.4 and various parts of the evaluation of potential effects discussed in Chapter 5. The feasibility study, though limited in scope, concluded that it would be geologically feasible to construct a reservoir at the location and to the elevation described in the EIS. The report on the feasibility study also indicated that the limestone terrain would be highly susceptible to leakage, the karst drainage system would require treatment, and a grouting program would be needed to reduce the potential for leakage. The report also pointed out the need for additional evaluations of the underlying geology before proceeding with detailed design and specifications of the possible reservoir project.

J. Ground Water

J1. *The project area is generally karstic and as such has sinkholes and other natural conduits to the water table. Construction of a reservoir in these areas could promote contamination of ground water if the reservoir water quality and sediment quality becomes degraded and migrate into the water table. The DEIS mentions (pg. 142) the potential for grouting the bottom of the reservoir area during construction to prevent such interconnection. Special engineering methods would be needed in these karstic areas, particularly those involving excavation, low elevations, caves, and similar geologic features. The greatest potential for ground water impacts among the alternatives appears to be the construction of the reservoir.* **EPA, 51u**

Response to Comment: J1: TVA agrees that construction of a reservoir in this karst area could promote contamination of the ground water if water in the reservoir became degraded and migrated into the water table. This was acknowledged in Section 5.3 of the EIS, accompanied by the suggestion that grouting may be required to prevent intrusion into the ground water. If this alternative was selected, geologic surveys would need to be conducted to determine the extent of potential surface/subsurface connections. Based on those surveys, measures to prevent extensive surface water intrusion (such as grouting or sealing) would be determined through special engineering studies as part of the detailed planning for that project.

J2. *Adoption of Alternative C entails the development of a 13-mile pipeline and the subsequent construction of its downstream Duck River booster station. The sinkholes and caves at this venue often form delicate conduits or natural water pipes. There are concerns that, during construction, the sinkholes and caves may be impacted. Such impacts during construction might involve irreversible collapsing of the fragile karst topography, quite possibly increasing the likelihood of ground water contamination.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33b**

Response to Comment J2: The installation of pipelines in karst terrain is routinely done for water, natural gas, and various petroleum products. As indicated in Section 5.3, a variety of avoidance and engineering techniques are available for mitigating impacts to the subsurface environment during the installation of a pipeline. It is true that karstic geology may contain sinkholes, fissures, and caves; however, those areas are still rock strata and, as such, are normally very stable and solid. Should this alternative be selected, specific measures to mitigate subsurface impacts would be addressed in the subsequent engineering evaluations and the evaluation of possible environmental effects.

J3. *What effect on the ground water resources in the Elk River Watershed as a whole would result from the reduction in the capacity of the Tims Ford Reservoir to recharge groundwater supplies.* **Mark H. Dudley, 24g**

Response to Comment J3: There would be no measurable effect on the groundwater resources in the Elk River watershed. The only time Tims Ford reservoir would have water removed to the Duck River would be during a drought year. During such a time, the elevation of the reservoir could be reduced by 7-8 inches, which is well within the normal operating range of Tims Ford Reservoir and would not have any effect on ground water.

K. Surface Water

K1. [I]*t is unclear what criteria TDEC uses to determine that one stream segment is suitable for an industrial water supply designated use, and not for a municipal water supply designated use.* **EPA, 51ab**

Response to Comment K1: Many of the use classifications in effect today were assigned to streams several years ago when Tennessee initially adopted water quality standards. At that time, a stream reach was classified for water supply use if it was being used for water supply or if a sufficient volume of water was available to support that use. In recent years, TDEC has been diligent to classify all streams for fish and aquatic life and recreation uses in accordance with the Clean Water Act. TDEC has not gone back and added the industrial and domestic water supply use classifications to all stream reaches not currently classified for those uses; however, they would likely respond to a local request to have a use added. TDEC probably would use its EPA-approved water quality criteria for Domestic Water Supply and Industrial Water Supply when determining the suitability of a specific stream reach.

K2. *We note from page 82 that: "The domestic water supply use classification is excluded in these areas because the State of Tennessee (TDEC) considers stream reaches immediately downstream from municipal wastewater discharges to be unsuitable for domestic water supply withdrawal." The state's criteria and scientific basis for this decision is unclear. How does TDEC determine where such an exclusion zone should no longer exist? Although not a TVA decision, we would appreciate some discussion on this matter in the FEIS.* **EPA, 51aa**

Response to Comment K2: As a matter of policy, TDEC no longer considers the first five miles of stream reach downstream from a wastewater discharge to be unsuitable for domestic water supply use. If TDEC were to allow a domestic water supply intake to be sited in a specific reach of the Duck River not presently classified for domestic water supply, the reach would be reclassified to protect that use. Reference to the previous policy in Section 4.4 has been deleted.

K3. [S]*ediments and disinfection-by-products (THMs) have been a significant issue for the public water supply system currently using the Duck River as its source water. The source, effects and control of THMs should be discussed in the FEIS.* **EPA, 51t**

Response to Comment K3: The suggested discussion has been added to Section 4.4.

K4. [S]*ediments and disinfection-by-products (THMs) have been a significant issue for the public water supply system currently using the Duck River as its source water. THM precursors include algae and high Total Organic Carbon (TOC) levels, which are in turn related to elevated nutrients. We strongly recommend a TVA commitment for source water protection as part of the preferred alternative in the FEIS. We believe such protection should be part and parcel of any potential approval of a water supply project.* **EPA, 51ac**

Response to Comment K4: Information presented in Section 5.4 identifies the need to protect the additional water supply source. TVA agrees that management of potential sources of contamination through source water protection efforts is a critical need in the upper Duck River watershed. TDEC has an EPA-approved Source Water Assessment Program and assessments for individual water systems

are presently underway. Regardless of which water supply alternative is pursued, the state program would be the appropriate avenue for ensuring that source water protection is implemented.

K5. *The draft EIS does not address cumulative impacts of projected development on water quality or the water supply needed to clean the anticipated Total Maximum Daily Load (TMDL) created by development. Failures to address this issue can be found among the many streams listed on the Tennessee Department of Environment and Conservation's 303D list.* **Marty Marina, Executive Director, Tennessee Conservation League, 58e**

Response to Comment K5: State and local governments, which regulate public and private wastewater systems, are responsible for ensuring that growth and development do not aggravate existing water quality conditions or adversely affect water quality and stream uses.

K6. *Additionally, we were concerned that increased water surface on the lake increases the evaporation rate, offsetting the benefit. No analysis of this offset was presented. Was it studied?* **John M. Procter, Elk/Duck River Chapter, Trout Unlimited, 60d**

Response to Comment K6: The slope of the shoreline surrounding Normandy Reservoir is very steep, so raising the normal summer pool elevation by five feet would increase the surface area by just 230 acres (from 3230 acres to 3460 acres - see Section 3.6), about a seven percent increase. Because evaporative loss is related to the amount of surface area, no more than a seven percent increase would be expected in the volume of water lost to evaporation.

K7. *At the time Normandy Lake was on the planning board, it was pointed out that due to the small flow of the Duck River an amount equal to the actual flow would evaporate each day from the lake. Thus there was not much gain as far as water supply is concerned. Now here we are, with the need for water increasing. If Franklin and Moore County have been limited in the amount of development in the name of water quality, then it is time to put the brakes on development in the Upper Duck River Basin.* **F. Montgomery Adams, Jr., Franklin County Executive, 29e**

Response to Comment K7: Evaporative losses would be greatest in hot dry months such as July, August, and September. In August, when evaporative losses in the Duck River watershed would be highest and the volume of water flowing into Normandy Reservoir would be lowest, the volume of water entering the reservoir would still exceed the evaporative loss by 25 percent.

K8. *To help further assess the potential success or problems associated with the reservoir alternative, we suggest that water quality monitoring data for the nearby Normandy Reservoir (which by now has aged or equilibrated as a reservoir) be provided in the FEIS for comparison, to the extent the two reservoirs are similar. We have also enclosed an EPA Region 4 checklist (EPA Section 404 Reservoir Review) prepared by our wetlands section that should provide additional guidance in assessing potential reservoir projects.* **EPA, 51m**

Response to Comment K8: Water quality conditions in Normandy Reservoir are discussed extensively in Section 4.4, especially with respect to low dissolved oxygen concentrations, high concentrations of iron and manganese, and high chlorophyll-a concentrations. Section 4.4 summarizes findings from many years of water quality analysis on Normandy Reservoir and uses that information, in part, as the basis for

the predictions of water quality conditions expected in a reservoir on Fountain Creek. Section 5.4 also summarizes the undesirable water quality conditions identified on Normandy Reservoir that would be expected to occur in a Fountain Creek reservoir and predicts conditions even more severe at Fountain Creek due to the slower flushing rate. The most recent data report on Normandy Reservoir has been added in the list of references (Section 6.3).

K9. *The modification of introducing cold, oxygen-depleted, bottom water into the system will possibly further deplete the dissolved oxygen -- possibly disrupting the complex thermal stratification layers in the water. Such a disruption could also interfere with nutrient cycling -- a necessity for all life in aquatic systems. Accurate impact assessments dealing with such intricately complex cycles and oxygen depletion effects (often exponential) in Alternative B should be approached with caution.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33g**

Response to Comment K9: These are important issues that can and should be dealt with in the detailed design of the outlet structure for a Fountain Creek reservoir if that alternative is pursued. The outlet probably would be designed to ensure that releases from the dam would contain at least 5 mg/l of dissolved oxygen. Water released from the reservoir also probably would not be allowed to adversely affect aquatic life or other beneficial uses in the reach of Fountain Creek immediately downstream from the dam or in the adjacent reach of the Duck River.

K10. *Additionally, many bivalent metal ions tend to dissolve out of solution and into the soils over time. However, a lowered pH and depleted dissolved oxygen will cause many metals (calcium, manganese, etc.) to dissolve back into the water. This alone can have a hazardous effect upon humans via primary ingestion, secondary, ingestion or prolonged contact.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33h**

K11. *The extraction of soils necessary for construction would subject the nearby waters to high amounts of dissolved metals, petroleum and organic acids that have been long since trapped within the soils. This contamination could effectively lower the pH, possibly affecting nearby ground water tables. In addition, increased amounts of freshly killed plant matter and the introduction of carbon rich humus into the heterogeneous waters may cause many species of heterotrophic bacteria to bloom. Collectively, potential effects of lowering the dissolved oxygen content in the reservoir as well as increasing the chance for an outbreak of dangerous bacteria such as Cryptosporidium sp., E coli and other fecal coliform merits further rejection of Alternative B.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33f**

Response to Comments K10 and K11: Dissolved metals such as iron and manganese would be expected to be present in the deeper water of a Fountain Creek reservoir when dissolved oxygen concentrations were very low. Concentrations of iron and manganese would be regulated under the secondary standards of the Safe Drinking Water Act because they would affect the aesthetic quality of drinking water but not human health. Dissolved oxygen depletion in the deeper water of a Fountain Creek reservoir would likely be more severe during the first 2-5 years after impoundment than in later years due to the decay of vegetation left in the reservoir and the breakdown of oxygen-demanding material present in the inundated soil. Effective control of non-point sources in the Fountain Creek watershed would be essential to prevent potentially harmful bacteria from entering the water supply reservoir.

K12. *The Fountain Creek reservoir does not appear to be a viable alternative in light of the estimated cost and potential for eutrophication caused by the nutrient rich Fountain Creek basin. Both TVA and the Tennessee Department of Agriculture have identified many nonpoint source water pollution issues throughout the watershed. These water pollution issues could have long-term impacts on the biodiversity of the area, particularly aquatic species. Correction of these problems is not a documented cost nor included in the discussion of impacts of this proposed alternative.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64d**

Response to Comment K12: Available information suggests that the Fountain Creek watershed has significant non-point sources which should be corrected regardless of which alternative is selected. Non-point contamination sources would be a continuing threat to a water supply intake directly in the reservoir or one located downstream of the mouth of Fountain Creek. The cost of a watershed-wide non-point source pollution management program was not included in the order of magnitude cost estimate for the Fountain Creek reservoir alternative. Fountain Creek is listed on the TDEC Section 303(d) list which means that in the future non-point pollution sources will have to be corrected to restore use of the stream. If the Fountain Creek reservoir alternative was selected for implementation by local governments before the non-point source management program is in place, then an accelerated correction program probably would be needed. In addition, the non-point source pollution management program required to correct current use impacts to the free flowing Fountain Creek would not be as extensive or as costly as the program needed to protect a water supply reservoir.

K13. *The letter dated April 6, 1979, from D. L. Muland, then the Director of Division of Water Quality Control, to Mr. John L. Ferguson, then TVA Project Manager, stated that Columbia Reservoir would have limited water quality related to the summertime eutrophic conditions that future water user in the Columbia area have not been made aware of. Well, I didn't know anything about it until about three years ago when we ran across this information.* **William Derryberry, 73d**

K14. *We've already spent $84M on a dam and then had it tore down and not a drop of water put behind it. The reason they tore it down is the same reason they can't be none put behind a Fountain Creek Dam. In a letter dated June 6, 1979, from Steve Anderson of the Tennessee Department of Public Health to the Commissioner of Health, Eugene W. Bowwinkle, MD, states that the Columbia Reservoir would have severe water quality problems, would not be another high quality Tennessee lake, and the Tennessee public health recommended that certification of Columbia Dam be denied. The Columbia Reservoir would degrade the water quality of the Duck River. Now if the Columbia Dam would degrade the water of Duck River, what would Fountain Creek do? In this book right here on page 20 of the EIS, it states that in 1953, there was no streams running into the river from Normandy to Columbia, so at that time Fountain Creek was not even running. That was in 1953 and between there and 1960 I know there were two or more years that the water was not running because I lived on the creek and I went down there many a time and played in the mudholes and there was no water running, so what kind of quality of water are we going to have?* **William Derryberry, 73b**

Response to Comments K13 and K14: The water quality impacts of the four alternatives are fully described in the EIS, including water quality conditions expected in a reservoir on Fountain Creek. Water quality conditions in a Fountain Creek reservoir would be similar to the conditions predicted to occur in the

Columbia Reservoir, had it been completed. TDEC would likely require the water released from a reservoir on Fountain Creek to meet all pertinent water quality standards of the state of Tennessee, which would prevent any adverse impacts on water quality in the Duck River.

K15. *From a water-quality point of view, we believe Alternative C will have the Least Minimal Impact on water quality from both the natural reservoir and the reservoir construction area is minimal and does not run the risk of contaminating water from exposed soil runoff or wiping out entire communities of organisms. The amount of water transferred is sufficiently small enough, greatly reducing the risk of affecting nutrient cycling and thermal stratification or the lowered dissolved oxygen levels within certain population parameters.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33d**

Response to Comment K15: Comment noted.

K16. *Alternative D is projected to meet Columbia area water needs only through year 2035 while the other alternatives are projected to meet water needs up to or later than year 2050.* **Marjorie S. Collier, President, Friends of Short Springs, 27d**

Response to Comment K16: If Alternative D was pursued, water supply systems in the Maury/southern Williamson County Water Service Area would need to implement water conservation measures or adopt other means of meeting the anticipated water needs beyond the year 2035. A 10 percent conservation savings is a reasonable expectation since, throughout the United States, water utilities routinely accomplish at least this percentage of reduction in water use through conservation programs.

K17. *Allowing Alternative E [would] reduce valuable water supplies in the Elk River Watershed to allow more development in the Duck River Watershed, a watershed area whose capacity is limited is an example of poor planning. One, this encourages further development to occur in an area that is outgrowing the already limited resource of its watershed supplies. Secondly, [this] discourages development in the Elk River Watershed by reducing the impoundment's supplies and reducing groundwater recharge.* **Mark H. Dudley, 24a**

K18. *Recharging one river with another is not really solving the problem, for it creates other problems. A typical dry period in the Upper Duck River Basin is a typical dry period in our watershed, also. Water quality here is not very good now and during dry periods is less so. Dropping Tims Ford Reservoir by 7-9 inches in a dry period is not wise and would lead to further water quality problems here. As Franklin County grows, and you know we are, our water needs will grow too.* **F. Montgomery Adams, Jr., Franklin County Executive, 29c**

K19. *This study does not comment on potential effects downstream from Tims Ford Dam during periods of drought which might result from the reduced water supply in Tims Ford Reservoir.* **Mark H. Dudley, 24f**

K20. *We also want to bring to the committee's attention that promised minimum flows of 75 cfs have not been maintained in recent weeks and months on the Elk River below Tims Ford. This effect, coupled with the adverse effect of the new water cress operation, has many trout anglers who normally fish the Elk now preferring to fish the Duck. It has been a dry Fall season. I do not know if we are in drought conditions, but it sure*

does not seem we have had our 10 inches of rainfall to not be in one. Surely, everyone recognizes a drought in Columbia likely means a drought for the Elk River basin as well. It seems illogical to steal water from Tims when minimum flows already cannot be met. **John M. Procter, Elk/Duck River Chapter, Trout Unlimited, 60e**

Response to Comments K17 - K20: Tims Ford Reservoir holds 4.5 times more water in storage than Normandy Reservoir (approximately 535,000 acre-feet in Tims Ford compared to 117,000 acre-feet in Normandy). In 1995, the water systems in Franklin and Moore counties used 2.1 mgd of surface water and 1.7 mgd of groundwater from wells and springs, for a total water demand in both counties of 3.8 mgd. That level of water use would be equivalent to 12 acre-feet per day if all of the water was withdrawn from Tims Ford Reservoir. With steady or even additional growth in Franklin and Moore counties, there would be enough water in Tims Ford Reservoir to meet future water supply demands in the Elk River area while helping to meet the needs of adjacent water service area. The estimated lowering of Tims Ford reservoir pool elevation by 7 to 8 inches in drought years would have no measurable effect on water quality. TVA's ability to maintain an instantaneous minimum flow of 80 cubic feet per second downstream from Tims Ford Dam to support downstream uses also would not be affected by the operation of a pipeline similar to the one described under Alternative E.

K21. *I suggest that all water taken out of Normandy re-enter the Duck River watershed.* **Nancy L. Penrod, 69a**

K22. *One solution that might be considered would be to have City of Tullahoma, who draws its water from Normandy Lake, to deposit its treated wastewater into the Duck River instead of depositing into Tims Ford Lake as it now does.* **Robert N. Reed, 28c**

K23. *One possibility would be to discharge back to the Duck River all treated water originally drawn from it. This would include Tullahoma, among others.* **F. Montgomery Adams, Jr., Franklin County Executive, 29d**

K24. *If you need to increase the flow of Duck River, we have a proposal for you. Currently, the City of Tullahoma draws its municipal water from Normandy Reservoir on Duck River, but dumps its treated wastewater into Tims Ford Reservoir on Elk River. It would be far less costly to return the City of Tullahoma's wastewater to Duck River than to construct a twenty mile pipeline from Tims Ford Lake to Shelbyville. This would return both rivers to a more natural flow volume and would improve the water quality in Tims Ford Lake. If the resulting increase in water flow in Duck River should be insufficient to meet future demand in the Maury/ southern Williamson County Water Service Area, then that demand is unreasonable and should be lowered by placing limits on development in that area.* **Floyd and Linda Ayers, 32b**

K25. *We recommend that a modification of Alternative E (which we name here as Modified E) be considered to the extent that it might be feasible. Modified E relates to the Tullahoma Wastewater Treatment Plant (Tullahoma) discussed on pages 152-153. Tullahoma purchases water from the Duck River Utility Commission which withdraws from the Normandy Reservoir. Tullahoma then discharges its treated wastewater into Rock Creek which is a tributary of the Elk River, which is connected to and drains into the Tims Ford Reservoir. As such, water is being removed from the Duck River system and discharged into Tims Ford and, with Alternative E, Tims Ford water is being withdrawn and discharged into the Duck River. We suggest that the potential for Tullahoma returning its Duck River water to Duck River as Modified E be explored.*

This would avoid interbasin transfer and the Tims Ford 20-mile pipeline (albeit, the logistics and volumes of Modified E are unclear and the need for a pipeline of uncertain Tullahoma to the Duck River exists). **EPA, 51p**

Response to Comments K21 - K25: TVA does not consider the discharge of this wastewater into the Duck River to be a viable alternative to meet future water needs of the Columbia area. The present volume of the Tullahoma wastewater discharge is about 3.0 mgd and, even with growth over the next 50 years, the volume of water available from this wastewater discharge would not be sufficient to meet the 14 mgd water supply shortfall which is projected to occur in the Maury/southern Williamson County Water Service Area by 2050. Furthermore, relocating the discharge to the Duck River downstream from Normandy Dam would require the construction of a 12- to 15-mile long pipeline and a pumping station to transport the wastewater from the Tullahoma treatment plant. Also, the cost of constructing a pipeline through the urban area of Tullahoma would be substantial.

K26. *My calculations indicate that just by retrofitting the present 17,500+ residences (based on the population numbers listed for the Columbia/Spring Hill/Thompson Station service area) with cisterns of 0.75gal/sq.ft. of house, the equivalent of 3+ mgd (at 50 inches of rain per year) would be captured. This is roughly 50% of residential use, which is probably used primarily for landscape irrigation anyway. Furthermore, there is no reason why cisterns could not be incorporated into commercial and industrial applications. Each system could be installed for less than $0.50 per gallon of capacity. This is expensive compared to the other options, but this option would provide multiple secondary benefits. Furthermore, as growth continues the installation of cisterns could be incorporated into local building codes, with costs added to new homes and businesses (possibly with incentives like In Lieu of a portion of Impact fees).* **Richard E. Lockwood, 31d**

Response to Comment K26: Studies suggest that about 32 percent of the total water used by an average household is used outdoors. If this is true and if every household used a cistern for outdoor use, by 2050, the potential water savings in the Columbia area would be about 4 mgd. The estimated additional water supply needed in the Maury/southern Williamson County Water Service Area in 2050 is 14 mgd. Therefore, the 4 mgd estimated to be saved by household cisterns would not, by itself, be enough to meet the future needs of the area. The concept of cisterns falls into the category of water conservation measures individual homeowners on a public water system could implement to save water. Other water saving measures which have been adopted by homeowners include retrofitting inside plumbing fixtures with water saving faucets, shower heads, and toilets. General public acceptance of cisterns would probably be low due to the construction cost, siting considerations for each residence, construction inconvenience, operation and maintenance difficulties, and potential liability. Most citizens probably would rather pay to have water supplied to them through pipes than deal with a household cistern system.

L. Aquatic Life

L1. *We were told it was snail darters and everything else and mussels but that couldn't be so because they turned lose those otters and they've eaten nearly every one of those mussels. There are mussel shells everywhere over there.* **William Derryberry, 73e**

Response to Comment L1: Recent surveys of mussel resources indicate that a wide variety of species and large number of individuals still occur in suitable habitat along the length of the Duck River. River otters apparently do eat some mussels; however, they also apparently reduce the number of muskrats, which would lower the number of mussels that muskrats would eat.

L2. *Alternative B will have the greatest effects on the quality of surface and ground water. The large area necessary for construction will have adverse effects on a complex array of aquatic ecosystems. For example, by destroying undetermined species within the large non-surveyed areas, we cannot be certain of the impacts that one or perhaps three or four species disappearance would have on the system as a whole.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33e**

Response to Comment L2: Comment noted. Available information suggests that the aquatic species present in this potential project area are relatively widespread and common in the Duck River watershed. If future studies indicate that endangered or other rare species occur in either the surface or ground water which could be affected by this project, that information would be considered during the evaluation of potential environmental effects of building the project.

L3. *All minimum flows downstream of the proposed dam for Alternative B should be consistent with the U.S. Fish and Wildlife (FWS) and EPA guidelines that include minimum flow rates and variable flows consistent with sustainability requirements for fish and other aquatic inhabitants.* **EPA, 51ad**

L4. *There appear to be few impacts on the aquatic fauna associated with the adoption of Alternative C. Of the alternatives suggested by TVA, Alternatives C and E appear to be the most reasonable alternatives concerning aquatic life. Due to the relatively low amount of water that is being withdrawn from the proposed site in Alternative C, few negative effects would be likely. Sedimentation from construction could present localized problems in terms of disturbing habitats of benthic and lithophilic species, especially certain percid and cyprind fishes which utilize these habitats for spawning (12 darter species and 16 shiner/chub species).* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33i**

L5. *Additionally, there is concern that the project* [Alternative C] *may pose some localized threats to the mollusk fauna, as they, too, are sensitive to sedimentation from construction activities. Fortunately, the mollusk fauna at the potential withdrawal site (RM 104) does not contain some of the more sensitive mussel species (Epioblasma sp., Lemiox sp.). However, little or no survey data concerning the gastropod fauna from this reach is available. Given the presence of an endemic gastropod in the Duck River system (*Lithasia genticulata*), and the rich species diversity present in the Duck, it is incumbent on TVA to conduct a gastropod inventory in this proposed withdrawal area. TVA needs to be aware of what aquatic fauna is to be reasonably affected by a withdrawal station.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33j**

L6. *The proposed Alternative C would construct a water supply intake at a point downstream from Columbia in the Duck River and downstream from Cathy's Creek. The Draft EIS outlines suggested short-term impacts to ground water, surface water, aquatic life, terrestrial life, endangered species, etc. The document fails to identify the probable impacts of the proposed construction and water withdrawal. Although the document discusses the withdrawal of approximately a fifth of the maximum flow, the document does not acknowledge the potential impacts to reduced flow as seen during the most recent drought and low flow conditions (summer flow gauge records for 1998-2000).* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64k**

L7. *Alternative E proposes to transfer water from Tims Ford reservoir to a downstream site through a 20-mile pipeline and booster pumping station to the lower Duck River. The transfer of large volumes of water between watersheds (inter-basin) could result in artificial range extensions for aquatic species or increase the likelihood that exotic species could invade these watersheds e.g., zebra mussels. The Draft EIS does not consider these potential impacts. The long-term impact by minor but continued drawdowns is not fully addressed considering the reduction of water from Tims Ford reservoir as part of this proposal. The Draft EIS does not consider aquatic biodiversity impacts in the reservoir resultant from sustained water withdrawals during drought conditions.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64q**

Response to Comments L3 - L7: Section 5.5 addresses many of the possible effects on aquatic life which could occur if one or more of the action alternatives was adopted. As noted in that section, Alternative C would involve the withdrawal of up to 31 cfs near River Mile 100, which would reduce the minimum flow from approximately 147 cfs to approximately 116 cfs, a 21 percent reduction. This amount of flow reduction is not likely to have a substantial change in aquatic habitats or aquatic life in that part of the river. These and the other possible effects of the action alternatives would have to be reviewed or reevaluated and, perhaps, other issues would have to be addressed as part of the subsequent evaluation of whatever version of each alternative might be proposed to be built. As a point of clarification, the potential withdrawal associated with Alternative C would be approximately one-fifth of the minimum flow downstream from Catheys Creek.

L8. *Support for cool water fishery in Duck and Elk, a put and take fishery, and an increase in water releases. Reduced flows on the Elk results in poor water quality.* **Michael Finks, 35**

Response to Comment L8: Comment noted.

L9. [Alternative E] *would mean less water going downstream and therefore less water in Tims Ford Tailwaters thereby causing problems for the trout fishery enjoyed by numerous people from far and wide.* **Don F. Lee, 6b**

Response to Comment L9: If Alternative E was built essentially as proposed in Section 3.7, existing information and preliminary studies suggest there would be no change in the quantity or quality of the discharge from Tims Ford Dam and, therefore, no effect on the trout fishery downstream from that dam.

L10. *What is most concerning to our Chapter are the proposals to Raise Normandy Pool Level or add a Tims Ford Pipeline. Raising Lake Normandy is a disturbing project far from Columbia and individuals who likely don't appreciate this existing water source provision for their community. For a tailwater fisherman, a deeper reservoir at first sounds exciting. I regularly fish the Colorado River at Lees Ferry, Arizona, below Glen Canyon Dam. This 725 ft. high dam provides 48 degree water year round, even in the heat of summer! This river supports an incredible blue ribbon rainbow trout fishery. But I agree with the EIS - you have to realize that a larger operating minimum flow will expend the cool layer of lake water faster.* **John M. Procter, Elk/Duck River Chapter, Trout Unlimited, 60c**

Response to Comment L10: Once any of the alternatives was proposed to be built, detailed planning would have to be done, including specifically how the project would be operated. After that, the careful evaluation of potential environmental effects would have to include a review or reevaluation of the discussion presented in Section 5.5 concerning the possible impacts on aquatic life in each stream reach which would be affected.

M. Wetlands

M1. *As previously stated in the DE1S, the implementation of Alternative C would have short-term minor effects on some known wetlands. The minor effects are further defined as probable minimal construction effects in the DEIS. The severity of the minor short-term effects is apparently dependent on the proper siting, design, and construction of the contiguous facilities. Long-term effects and net loss or total displacement assessments for those wetlands are not adequately addressed in the DEIS. . . . . The wetlands in peril need proper denotations as either forested and scrub-shrub type or emergent type wetlands.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33k**

M2. *The greatest wetland losses are associated with B (reservoir) and D (raising Normandy pool). B would result in the loss of some 225 acres of forested wetlands as well as the loss of the reach of Fountain Creek that would be inundated. It is unclear if perhaps other non-forested wetlands may also be lost within the 2,200 acres to be inundated for the reservoir (the FEIS should therefore total all the estimated jurisdictional wetlands that would be inundated by the reservoir). It should be noted that EPA considers both vegetated wetlands and creek water as wetlands, and water inundation of the reservoir wetlands and creek water is considered the same as filling wetlands with soil.* **EPA, 51v**

M3. *The 225 acres of wetlands were not precisely determined in the field but were estimated by aerial false-color infra-red photography. A jurisdictional determination of these wetland habitats needs to be made pursuant to Section 404/U.S. Army Corps of Engineer regulations. Following this determination, an avoidance or mitigation strategy should be provided. The mitigation strategies (pg. 163) indicated in the DEIS were general in nature and should be refined to indicate a more specific mitigation plan. Although not required, a draft mitigation plan should be included in the FEIS as well as a commitment to provide wetland compensation to the satisfaction of the resource agencies.* **EPA, 51w**

M4. *Implementation of Alternative D, which would raise the elevation of Normandy Reservoir by five feet, would result in the inundation of riparian vegetation including "...several forested wetlands that now occur at the upstream ends of some reservoir embayments" (pg. 164) as well as herbaceous fringe wetlands along the current Normandy shoreline. It is unclear what wetland losses or conversions may be associated with the pipeline alternatives C and E. The FEIS should be more specific as to the kind, quality and function of the wetlands that would be lost for each alternative.* **EPA, 51x**

M5. *Consistent with 404 (b)(l) guidelines, the loss of wetlands associated with B and D would need to be considered in the alternatives analysis, especially since other practicable alternatives with less wetland impacts exist.* **EPA, 51y**

Response to Comments M1 - M5: As stated in Section 1.1, the analysis presented in this EIS has been conducted at a general (programmatic) level. With respect to wetlands, this level of analysis allows an initial assessment of wetland impacts, using existing data about wetland resources in the likely project areas. Specific, detailed assessments of the type, extent, and function of jurisdictional wetlands would be completed in the subsequent evaluation(s) of whatever projects are proposed to be built. Those evaluations would be consistent with state and federal

wetland protection regulations, and would include detailed mitigation strategies developed to offset the specific wetland losses associated with each project. Long-term effects and net loss of wetlands associated with the project(s) would be assessed in detail as part of the subsequent evaluation and environmental review. The wetland types associated with each alternative are described in Section 4.6.

N. Floodplains

N1. *Since the purpose of this project is to supply water, the pipeline and the intake will have to be constructed in the flood plain because there is no other feasible alternative. This will cause some disruption to the areas around the construction of the pipeline, but if the disturbed areas are reverted back to their natural state there should not be any long-term effects. The route chosen for the pipeline would take it across numerous streams. It is at these points that it will be crucial for the construction of the pipeline to follow best management practices to minimize the impacts of the crossings. The pipelines will also have to be constructed in a way to make them able to withstand flood like conditions and to comply with the National Flood Insurance Act. Alternative C would* [a]*ffect only small areas during construction, but without any major impacts. . . . . The effects upon the soils and the flood plain will be negligible.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33m**

Response to Comment N1: Comments noted. Because the pipeline would be underground, there should be no long-term problems with flooding impacts.

P. Terrestrial Life

P1. *Given the length of the proposed pipeline (13 miles), certain species could be affected either by directly disturbing habitat or through disturbance of foraging ability, nesting, etc. . . . . Most importantly to consider are habitat fragmentation effects associated with a pipeline right-of-way. This would have the potential to destroy underground nests/ burrows of terrestrial species and potentially impact a species metapopulation. TVA should address potential impact areas for whatever terrestrial species are located there, and provide some attempt to relocate species that most likely affected by pipeline construction. Additionally, TVA should investigate the possibility of co-locating the proposed pipeline in existing right-of-ways.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33n**

Response to Comment P1: TVA appreciates the concern related to the placement of the proposed pipelines and their potential effects on wildlife resources. The intent of the EIS is to outline the different options that are available for meeting future water needs in the upper Duck River basin and not to delineate or evaluate specific utility routes for each alternative. Evaluating the specific potential effects of an alternative proposed to be built would occur once each project was described in detail. Impacts to terrestrial resources would be better determined through additional, project-specific environmental reviews. Any populations of rare organisms and their habitats which could be affected by the project would be addressed as provided by appropriate State or federal laws.

Q. Endangered Species

Q1. *Attention to sensitive species (such as the Indiana Gray Bat) should be considered.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33r**

Q2. *Furthermore, a vascular and non-vascular inventory for endangered or threatened species is appropriate, if not imperative.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33l**

Q3. *As a part of our review of the subject Draft EIS, please be advised that we have reviewed our Departmental data bases and find recorded State and/or Federally listed species, within a one mile radius of the proposed Tennessee Valley Authority (TVA) project boundaries and within a one mile radius of the proposed managed lands (project alternatives). These species have very specific or rare habitat. Our records also indicate additional species occurrence records, sensitive ecological sites, and management areas, within an approximate four mile radius of the proposed project site(s). Your agency is aware of these records and we suggest that these records be further evaluated in cooperation with your Heritage Program in Norris, TN.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64a**

Response to Comments Q1 - Q3: The information presented in this EIS includes up-to-date knowledge about the status of endangered and threatened species in the areas which could be affected by the water supply alternatives. If and when one or more of these alternatives are designed and proposed to be built, the information about protected species would have to be reviewed and up-dated to cover whatever changes would have occurred in the status and known distribution of the protected species.

Q4. *Environmentalist will import some rare nonnative mussel or plant to the alternative "B" area and cause problems.* **Douglas K. Mitchener, 59e**

Q5. *I find it hard to believe that the area where the Columbia dam was being built is the only place that Snail Darters live. Even if it is, I don't think this is a valid reason to not complete something that is so valuable to human life. The people that caused this probably never had to haul water for their livestock or home. Just the way I feel.* **Kent Curtis, 4b**

Q6. *Given the fact that endangered mussels caused the Columbia Dam to be discontinued, TVA should ensure that no such endangered species or other unresolvable "show-stoppers" exist in the nearby Fountain Creek watershed if the reservoir alternative (B) is pursued.* **EPA, 51af**

Response to Comments Q4 - Q6: Whenever one or more additional water supply projects are proposed to be built in the area around Columbia (or elsewhere), federal law probably would require that the project be evaluated for possible adverse effects to any species then listed as endangered or threatened. At present, and as described in Section 5.9, none of the action alternatives is known to include activities which would have direct adverse effects on federal endangered or threatened species.

Q7. Schwalbea americana *and* Xyris tennesseensis *found in Coffee and Lewis Counties respectively are both considered not potentially affected or likely to occur in any of the*

alternative project areas. These assumptions are based on an 1879 site record and an eight-mile separation from a proposed alternative project area. The issue here does not concern itself with tangible distances and uncommonly intermittent records, or even distributions amongst physiographic provinces of protected plants near probable affected areas. But simply how can statements in the DEIS be made concerning the potential or likelihood of at least sixty-eight protected species occurring in alternative areas without a complete baseline vascular plant inventories. **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33q**

Q8. *The Water stitchwort (*Arenaria fontinalis*) is a Tennessee threatened and obligate wetland plant (OBI.). The Water stitchwort occurs in seepages and other wet areas along creeks. The OBL plant would not survive prolonged inundation. The Duck river bladderpod (*Lesquerella densipila*) is a Tennessee threatened and globally rare plant, which also occurs in the area of a proposed reservoir on Fountain Creek. Field surveys conducted in the spring of this year by the Division of Natural Heritage staff have documented serious declines in populations of this plant in the majority of its range. Several bottomland areas adjoining Silver Creek continue to support populations of this plant. These populations would be inundated under the Draft ElS, Alternative B.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64g**

Q9. *A change in water flow rates (downstream) or significant water withdrawals from the* [Normandy] *reservoir could affect two rare plants that occur in the Duck River. These are Water stitchwort (*Arenaria fontinalis*) a Tennessee threatened and obligate wetland plant, and Limestone blue star (*Amsonia tabernaemontana *var.* gattingeri*), a Tennessee special concern listed species and a facultative wetland plant. Comparing these two rare species, the Water stitchwort is more dependent on water (an obligate wetland plant) and would be sensitive to changes in hydrology (reduced seepage and flow rates). Occurrences of both species are found in the Duck River watershed, both above and below the confluence of Fountain Creek. It is unclear how the rare plant populations in the Duck River would be affected under the different alternatives, however the increased minimum flow under Alternative D could be beneficial to these rare species.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64n**

Q10. *It is important to note that the Division of Natural Heritage staff did not survey the area south of State Route 50 on Fountain Creek in the spring of this year for the Duck River bladderpod. This area could also support populations of the protected plant species (potentially inundated by the proposed Fountain Creek reservoir).* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64h**

Q11. *Considering endangered or otherwise protected vascular plant species of Tennessee, the DEIS methodology of determining the potential for a protected species to occur in any of the Upper Duck River Basin alternative project areas is unacceptable. Furthermore, simply stating the likelihood of a protected species occurring in an affected area as either 'yes' or 'no' is also unacceptable. For example,* Helianthus eggertii *occurs in nine (not eight) Tennessee counties (Chester et al., 1997). This composite, as noted in the DEIS, occurs approximately twelve miles SW of Columbia in Maury County. As stated in the DEIS,* H. eggertii *is not known to occur in the Central Basin Physiographic Province of Tennessee. However, significant portions of Maury, Bedford, and Davidson Counties each with a site record of the composite subsequently occur in the Central Basin Physiographic Province (Chester), including the station at*

Maury County. This alone establishes that the protected plant is not associated exclusively with the Highland Rim Provinces (East and West). Six counties in the Eastern and Western Highland Rim Provinces support H. eggertii *(Chester), not including the station at Coffee County as stated in the DEIS. Three of the nine known and documented Tennessee stations of the composite are supported in the Central Basin Province contradictory to statements issued in the DEIS.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33o**

Q12. *Considering that three of the populations [of* Helianthus eggertii*] occur in the Highland Rim Province and, more importantly three in the Central Basin Province, should not a complete vascular plant inventory be conducted before any alternative is implemented? Although surveys were conducted on Columbia Project Lands, their methodologies are poorly if at all delineated in the DEIS - merely stated as extensive surveys were conducted. Did the surveys intend to find only* H. eggertii *or all the state's listed and federal species? How is an extensive survey defined? Complete vascular inventories should entail a systematic collection within all affected areas, not merely probable habitats. Sampling should run through two growing seasons depending on the area and number of habitats and documentation of specimens (voucher specimens if applicable for protected species or even pictures) and their respective locations should all be obtainable by the public. Furthermore, extensive surveys are not tantamount to baseline inventories. Surely, a single voucher specimen for every vascular plant encountered was collected and identified in the Columbia Project Lands area. If not, how can the species probability or likelihood of occurrence be stated with any confidence*? **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33p**

Q13. [T]*his alternative* [B] *would inundate known populations of a number of rare plant species and could impact several registered State Natural Areas. The Glade cress (*Leavenworthia exigua *var.* exigua*), Tennessee milk-vetch (*Astragalus tennesseensis*), and Limestone fame-flower (*Talinum calcaricum*) are Tennessee special concern plants, which occur in the area of proposed inundation by a reservoir on Fountain Creek. These limestone cedar glade plants, that are globally rare and the plant communities (habitat), would be destroyed by inundation.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64f**

Q14. *A population of the Tennessee and Federally listed (endangered) Leafy prairie-clover (*Dalea foliosa*) occurs between 620 feet and 630 feet elevation in the Moore Lane Glade Registered State Natural Area. This area is outside of the Fountain Creek watershed, but would require protection from inundation (629-foot elevation) by the two proposed extension (saddle) dam structures west of the proposed Fountain Creek reservoir.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64i**

Response to Comment Q7 - 14: As indicated in Sections 1.1 and 3.9, the EIS evaluates the relative potential for environmental impacts associated with each of the five alternatives. A detailed review of potential environmental effects would have to be conducted if one or more of the action alternatives were proposed to be built. In addition, as stated in Section 1.8 with regard to the Endangered Species Act, "The evaluations also would have to focus on the species protected at the federal and state level at that time and comply with the laws and regulations then in existence." Project-specific field investigations would be conducted at that time, and any potential impacts identified at that time would be assessed. As indicated in Section 5.9 and documented in Appendix E, the U.S. Fish and Wildlife Service has

concurred with this approach to addressing any potential impacts on federal endangered species.

Q15. *The information presented indicates that the Moore Lane Glade Registered State Natural Area (west of State Route 50) will be directly affected by the proposed location of the dam and construction area. A raised water table resulting from the impoundment could effect stream flow throughout the proposed project area. Due to the karst features of the area, a small, unnamed tributary to the Duck River (within the Natural Area) could have increased flow from ground water inflow. It is not clear how this change in hydrology would affect the Leafy prairie clover populations, which occur within the Natural Area.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64j**

Response to Comment Q15: Based on information provided by the Tennessee Division of Natural Heritage since the publication of the draft EIS, *H. eggertii* is presently known from 12 counties in Tennessee. This change has been made in Section 4.9 in the final EIS. Although portions of some of these counties occur in the Central Basin physiographic province, a review of the specific localities of each *H. eggertii* population confirms that no populations are known from sites actually located within the Central Basin.

Q16. [T]*here are a number of Tennessee endangered, threatened and special concern plants which occur on lands above the 900 foot contour, around Normandy Lake at sites known as Rutledge Falls, Copperas Branch, and Short Springs Designated State Natural Area. The Division of Natural Heritage has no records of Tennessee endangered, threatened or special concern plants below the 900-foot contour of Normandy Lake.* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64m**

Response to Comment Q16: Comment noted. As stated in Sections 5.9, TVA is not aware of any protected species records from the area around Normandy Reservoir which could be adversely affected by raising the pool level. That conclusion would be reviewed and, if necessary, revised if some form of Alternative D was proposed to be built.

Q17. *Although not documented in the Draft EIS, there are numerous rare, threatened or endangered aquatic species records at the mouth of Fountain Creek and immediately downstream in the Duck River. Assuming suitable habitat exists within Fountain Creek, these species could be present in the watershed e.g., Coppercheek Darter (*Etheostoma aquali*) and Slabside Pearlymussel (*Lexingtonia dolabelloides*).* **Andrew N. Barrass, Environmental Review Coordinator, Division of Natural Heritage, 64e**

Response to Comment Q17: Information presented in the EIS includes the results of recent fish and mussel surveys in the Duck River and in the Fountain Creek watershed (see especially Appendix B). The survey results indicate that the coppercheek darter does occur in Fountain Creek; however, very few native mussels were encountered there. The coppercheek darter is a threatened species in Tennessee but is not, at present, listed as either endangered or threatened by the U.S. Fish and Wildlife Service. TVA believes the available information is sufficient to address the present status of any potential effects of building a Fountain Creek reservoir on protected aquatic species. That information probably would need to be up-dated if and when a reservoir was proposed to be built in that area.

R. Land Use

R1. *Alternative C would only have short-term adverse effects on land use, primarily because the location and construction of the pipeline, intake, and booster station can be adjusted so as to minimize their effects on prime farmland and other uses of the land in the area. Due to its minimum requirements for land (estimated to be 2 acres plus 130 acres of easement for the pipeline), this alternative is preferred over Alternative B which would require the disturbance of 3,600 acres of land.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33s**

R2. *The soils that are present in the Duck River area range from well to moderately well drained silty/loamy soils to highly acidic and low nutrient content soils. The silty/loamy soils are productive for a variety of different crops and considered prime farmland. Grazing cattle frequently use such soils. The economic cost of changing the land use of these few productive agricultural areas merits further investigations before implementing Alternative C.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33c**

Response to Comments R1 and R2: Comments noted. Under the present concepts, Alternative C would involve the permanent use of about two acres of land (to be occupied by the intake structure and the booster station). All other land along the route of the pipeline would be affected only during the construction period, after which the owner could decide how to use it. If these concepts carry forward into actual plans for this project (if it is to be built), Alternative C would not have any long-term impact on land use in the project area.

R3. *The fluctuation that occurs now from the necessary winter/summer pool flows have caused continuous loss of trees which are being undercut by the changing currents along the banks. In an effort to hold as much of the dirt along the banks as possible, we have planted trees along some of the most stressed areas. We would certainly like to see them grow and aid in the protection from erosion that more and higher water levels would make impossible.* **Polly Dement Oettinger, 41b**

Response to Comment R3: The changes in flow patterns which would occur under any of the action alternatives would take place only during drought conditions. None of the alternatives would have any effect on the conditions described in this comment.

R4. *The disposition, ownership, and management of the environs surrounding the reservoir proposal (B) are a major shortcoming of the DEIS. As other reservoir projects in the nation have experienced, control of nutrients in the reservoirs and lakes in the southern U.S. are a continuing challenge. Shallow, warm water bodies enriched with nutrients from farmland and agricultural runoff and natural sources quickly become colonized with mats of aquatic plants and algae. To control nutrient enrichment and eutrophication, the drainage basin containing the reservoir will likely require management measures and land use controls including but not limited to: creation of buffer zones in perennial and intermittent streams in the watershed; timber cutting and agricultural use restrictions in buffer zones; lot size and housing density restrictions; policies on septic tank placement and maintenance, and other strategies to prevent pollutants and nutrients from entering the proposed reservoir. If Alternative B is selected by TVA as its preferred alternative, the FEIS should provide at least a draft basin management plan that includes TVA policies and procedures on shoreline*

management, water quality, monitoring, aquatic weed control, fisheries, etc. as they relate to the proposed Fountain Creek Reservoir. As an example of reservoir management techniques that may be useful in addition to TVA's management EISs such as the recent Shoreline Management EIS, we have enclosed the watershed management rules that the State of North Carolina required for the Lake Randleman watershed (Randleman Watershed Management Rules) in 1998. **EPA, 51ae**

Response to Comment R4: TVA concurs with the basic points made in this comment; however, TVA is not planning to make the decision to construct one or more of these alternatives and TVA probably would not select any additional purpose(s) to be included in one or more of these water supply projects. The EIS identifies that the source of additional water for the Columbia area would have to be protected from contamination and nutrient enrichment. Insuring that appropriate land and water use decisions are made can best be accomplished by the project sponsor(s) and the regulatory agencies.

R5. *Surely the history of overdevelopment in some of the Western states without adequate water sources should play in mind when forming water and land use strategies for this area. The Tennessee Department of Environment and conservation has taken the initiative to limit development along the shores of Tims Ford Lake; not soon enough, but a step in the right direction. Other watersheds should do the same.* **Robert N. Reed, 28b**

R6. *Pumping Tims Ford Reservoir water to discharge into the Duck River, although an engineering possibility, is contrary to what the TVA envisioned and documented in the Tims Ford Reservoir Land Management and Disposition Plan and EIS. The number one consideration with the Tims Ford Reservoir plan, and what amounts to severely restricted development of the 6000 public acres in Franklin and Moore counties surrounding the reservoir, is land conservation in the name of water quality. Just as when water quantity issues were correctly foreseen for one purpose of the Columbia Dam, water quality issues are at the forefront of Tims Ford Reservoir Land Management Plan and EIS. If, in the name of water quality, we are not allowed to put large areas of tax producing real estate on the market and develop them in the name of expanding our tax base and are, then, compelled to sign on to a project that will degrade further the quality of Tims Ford Reservoir water; I strongly take issue. We would be in effect rewarding unbridled growth in one area of the state by limiting growth in another. At the same time, our area would suffer without direct or indirect benefit.* **F. Montgomery Adams, Jr., Franklin County Executive, 29b**

Response to Comments R5 and R6: Comments noted. Under the recent amendments to the Clean Water Act, the protection of water quality probably would essentially dictate land use decisions in both the Duck and Elk River watersheds, regardless of whether a pipeline connection is constructed or not. The long-term quality and optimum use of these river systems and reservoirs would depend on the ways land use decisions are made all across each watershed.

R7. *While TVA may still claim ownership of 60 acres at Short Springs along the present Normandy Reservoir, this land was designated a TVA Small Wild Area and has subsequently been made a part of the Designated Short Springs State Natural Area under the Natural Areas Preservation Act of 1971. The purpose of the act is to protect areas possessing scenic, scientific, including biological, geological and/or recreational values which are in prospect and peril of being destroyed. Short Springs Natural Area*

is a Class I - Scenic/ Recreational Area under T.C.A. 11-14-108 (b)(1)(O). **Marjorie S. Collier, President, Friends of Short Springs, 27c**

Response to Comment R7: Comment noted.

S. Visual, Recreation, & Natural Areas

S1. *Alternative C would have only a minimum impact upon the recreational use of the Duck River - and for only a brief period of time. Only a very small (< 1 acre) would be required for the intake structure. Also, neither the presence nor operation of the underground pipeline would negatively impact the recreational use of this river.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33t**

Response to Comment S1: Comment noted.

S2. [T]*he potential for mitigation measures to protect Short Springs Natural Area should be documented in the EIS.* **Justin P. Wilson, Deputy to the Governor, 43i**

Response to Comment S2: As indicated in Sections 5.11 and 3.9, raising the pool level on Normandy Reservoir as described under Alternative D would have adverse effects on a small part of Short Springs State Natural Area where substantial wildflower populations occur. If that alternative was proposed to be built, detailed plans for the project would be prepared and an appropriate environmental evaluation would be conducted. At that time, project-specific issues, including avoidance and/or mitigation measures in the natural area, would be addressed based on the detailed plans for the project.

S3. *We feel that any negative impact to Short Springs State Natural Area, which has been designated as biologically significant by the State of Tennessee for nearly 20 years, sets an unacceptable precedent.* **Leslie Colley, The Nature Conservancy of Tennessee, 44e**

S4. *I have always been impressed with the willingness of TVA, the state of Tennessee, and the city of Tullahoma to join together to protect the truly unique environs containing Short Springs. It dismays me to think that all of that hard work could disintegrate so quickly. Please consider carefully the legacy that will be left.* **Jeff Stewart, 52c**

S5. *Raising the Normandy Pool Level would be detrimental to Short Springs State Natural Area by inundating lower portions, particularly the area where Bobo Creek and Machine Branch join and where a rich profusion of wildflowers occurs. A portion of the Natural Area extends along Bobo Creek as far down as Carroll Creek and this would also be detrimentally affected.* **Marjorie S. Collier, President, Friends of Short Springs, 27b**

S6. *I wish to urge TVA to not recommend Alternative D in the final Environmental Impact Statement. Short Springs is one of the most beautiful natural wildflower areas around. This small area contains many, many specimen of flowers and is enjoyed by all ages. I love to take my grandchildren there, they love it. Please do not ruin this special place. Surely one of the other alternatives would work as well without destroying the natural beauty of Short Springs.* **Mrs. Herschel McDonald, 57**

S7. *I have just received the very discouraging and disappointing news that your company (TVA) is considering the expansion of services in this particular area of the State (Short Springs). To me it is ludicrous to even think of increasing the services of Normandy Dam; which would entail the destruction (perhaps extinction) of a considerable amount of plant and animal life in some of the most beautiful natural area's of this portion of*

our state. I am also surprised such corporations as TVA would challenge (violate) existing legislation as the preservation law of 1971. I therefore, am vehemently opposed to such action and will do all in my power to convince others to do and feel likewise. **A. E. Smedley, 56**

Response to Comment S3 - S7: TVA recognizes the unique suite of natural features which exist along the reservoir shoreline in the Short Springs State Natural Area and shares the agency and public commitment to this site. If the decision is made to raise the pool level on Normandy Reservoir, TVA would actively participate in determining the potential effects on Short Springs and assist in minimizing or mitigating losses to the site which could not be avoided.

S8. *Currently, residents near the area of the proposed* [Tims Ford] *intake, "regular" boaters and fishermen, and transient boaters and fishermen enjoy a quiet zone, free from industrial type noise....like the continuous hum of high speed electric pumps. This would change dramatically in this area, noting that sound carries well over water, particularly on a quiet night.* **Mark H. Dudley, 24h**

Response to Comment S8: If Alternative E was proposed to be built, appropriate measures would be taken to minimize noise levels associated with the intake structure. As indicated in Section 5.10, these measures could include using low-noise equipment, and locating and designing the intake to minimize noise production. Properly located, designed, and constructed, this alternative would have insignificant effects on local noise levels.

T. Cultural Resources

T1. *When compared with Alternative E (requiring a 20-mile-long pipeline), and Alternative B (requiring the disturbance of 3,600 acres), Alternative C would only disturb a small amount of land. Therefore, assuming that the potential cultural resources are evenly distributed, the Alternative C would have the least impact on any existing cultural resources. In addition, after the site/ route is reviewed by the Tennessee State Historic Preservation Office, the pipeline construction could be adjusted to minimize further disturbance to cultural resources under this alternative.* **Environmental Science Graduate Students, University of Tennessee at Chattanooga, 33u**

Response to Comment T1: Comment noted. Assuming a maximum corridor width of 50 feet for pipeline construction, Alternative C would affect approximately 130 acres of land and Alternative E would affect approximately 200 acres. Enlargement of Normandy Reservoir under Alternative D would affect 230 acres and the construction of a reservoir in the Fountain Creek watershed as described under Alternative B would affect approximately 3,650 acres.

T2. *Considering available information, we find, after applying the Criteria of Adverse Effect codified at 36 CFR Part 800, that the project as currently proposed will ADVERSELY AFFECT PROPERTIES THAT ARE ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES. Therefore, this office has an objection to the implementation of this project. You should now, through TVA, inform the Advisory Council on Historic Preservation of this adverse effect determination and begin immediate consultation with our office. Please enclose a copy of this determination in your notification to the Council as delineated at 36 CFR Part 800. Until you have received a final comment on this project from this office and the Council, you have not completed the Section 106 review process.* **Herbert L. Harper, Tennessee State Historic Preservation Office, 12**

Response to Comment T2: These comments were made by the Tennessee State Historic Preservation Officer (SHPO) in a letter dated September 14, 2000. The SHPO provided amended comments by letter dated October 19, 2000 (see Appendix E) indicating that this undertaking is limited to the drafting of a programmatic EIS for future project implementation and, as such, will not affect any properties listed or eligible for listing on the National Register of Historic Places. Appropriate review of the detailed plans for any alternative proposed to be built would be conducted as a part of the subsequent evaluation of potential environmental effects.

U. Socioeconomics

U1. *We do not accept the premise in the Draft EIS that there will be no growth in "new large, water consuming industries." The Tennessee Department of Economic and Community Development believes that industrial growth will be critical to the future growth of the region.* **Justin P. Wilson, Deputy to the Governor,43g**

U2. *While the DEIS indicates that the Fountain Creek alternative will be the most expensive and may have the greatest environmental impact, it could be penny wise and pound foolish to try to cut it so close with the economic future of the area. Past investments in community infrastructure developments have made possible industrial locations and expansions which simply would not have occurred without such investments. These locations and expansions have been vital to the region's economy and have more than repaid the investments made. The same will be true in the future. Further, our expanding environmental capabilities and regulatory protections ensure more than ever that such growth can occur with minimal, if any, negative impact upon our environment.* **Wilton Burnett, Jr., Special Projects, Department of Economic and Community Development, 63c**

U3. *The DEIS analyses assume that no new water-consuming industries were to site in the watershed and increase the water demands. In addition, it is somewhat unclear if agricultural needs were adequately included. Page 24 of the DEIS states that "[t]he amount of water withdrawn for agricultural irrigation is not known, but given the intensive agricultural land use in the three county area, significant amounts could be drawn during an extended drought." Similarly, page 25 states that the USGS, in their 1996 needs evaluation estimates, "...did not include any water for new, self-supplied industries or major expansions of agricultural water use in any of the three water service areas." The FEIS should further discuss agricultural needs and the potential for agricultural expansion and additional water-consuming industries siting in the area.* **EPA, 51e**

Response to Comments U1 - U3: As indicated in Section 2.5, the projections used in the EIS allow for increases in industrial water use in excess of recent growth in the area. They do not, however, include provision for new, large, self-served, water-using industries such as chemical plants, paper mills, or major agricultural expansions. While those types of industries are not likely to locate in the area, if such a facility did locate in the watershed, it would require revision of the water needs projections. It should also be noted that many industries now employ processes that use considerably less water than in the past. A good example is the Saturn plant at Spring Hill, which uses only about one-fifth the water a comparable older automobile manufacturing plant would use (see sidebar on page 19 of the 1998 *Water Supply Needs Analysis for Bedford, Marshall, Maury, and Southern Williamson Counties Tennessee*).

U4. *The draft EIS is geared to providing enough water for Columbia to grow at the present rate for the next 50 years. We believe the present rate was not anticipated when the dam was originally projected and cannot be sustained for so long a period. Further, planning for it (or failing to recognize this) will eventually negatively impact Colombians' quality of life and the economic viability of other counties in the watershed. Atlanta could serve as a poster child for unbridled development.* **Marty Marina, Executive Director, Tennessee Conservation League, 58c**

U5. *Take a look at the current water problems in Los Angeles, California, and Phoenix, Arizona, caused by over-development for the available water supply. We should be learning from their greed centered errors, rather than emulating them. Tennessee is blessed with abundant fresh water. Why concentrate too much development in an area with insufficient water to sustain it? Once this pattern is established, it feeds upon itself and becomes irreversible.* **Floyd and Linda Ayers, 32c**

Response to Comments U4 - U5: Based on present trends and conditions, the existing water supply in the Maury/southern Williamson County Water Service Area is expected to be adequate until during drought conditions some time after 2015. If the demand continues to increase as projected, a decision will be necessary regarding whether to augment the supply and, if so, how to do it. A decision to not increase the supply and thereby restrict population and economic activity to a level that could continue to be supported by the existing supply is the No Action Alternatives.

U6. *I also want to know if anybody has considered the impact of Highway or In-State 840 upon this area and what it is going to do in the areas of Marshall, Murray, and Williamson Counties. Continued growth in Marshall County was too low on that screen; I can tell you today it will more than double, it will more than triple in size simply because of the location of factories and industrial base we have in Marshall County. Murray County will soon see a major growth in industry as it is already doing due to the Saturn Plant at Spring Hill. Satellite factories will continue to come in; that means more people, that means more need for water, and we don't have it.* **Randy Short, 80d**

Response to Comment U6: When it is completed, Highway 840 is expected to have significant impacts on the northern end of Maury County and on southern Williamson County. These effects have been included in the projections of local economic growth. The impact of this new highway on Franklin County is less clear; however, the population projection for Franklin County recognizes and builds on the recent growth in the county.

U7. *The Related Documents identified in the EIS (Page 12) listed only the Draft EIS on the use of land surrounding Tims Ford Reservoir. Again, a myopic view without proper consideration of other effects on the area, does not take other important factors into account. Socioeconomic impacts listed in the EIS do not address any potential impacts to the Franklin County area, other than construction and related activities.* **Mark H. Dudley, 24e**

U8. *The Franklin County area is in a "growth spurt". New major highways have been created, old highways are being widened, our industrial base has seen multi-national industrial companies relocating to this area, most notably Nissan's Decherd facility, and the numbers of residential and commercial Building Permits have increased by about 80% over the numbers just six years ago. It is a distinct possibility, given that Nissan located in this area, new roads have been created, our central location, our recreational resources, that other large, water consuming industries may locate in Franklin County in the near term. This EIS, in my opinion, does not see beyond the boundaries of the study area, particularly at the future adverse socioeconomic impact of reducing precious water supplies to the Elk River Watershed.* **Mark H. Dudley, 24d**

Response to Comments U7 - U8: This programmatic EIS focuses on the water needs of the three water service areas in the upper Duck River watershed However, because of the concern expressed and the potential impact of one of the alternatives on Franklin County in the Elk River watershed, we have looked at the water needs situation in that county. Tims Ford Reservoir holds 4.5 times more water in storage than Normandy Reservoir (approximately 535,000 acre-feet in Tims Ford compared to 117,000 acre-feet in Normandy). In 1995, the water systems in Franklin and Moore counties used 2.1 mgd of surface water and 1.7 mgd of groundwater from wells and springs, for a total water demand in both counties of 3.8 mgd. That level of water use would be equivalent to 12 acre-feet per day if all of the water was withdrawn from Tims Ford Reservoir. With steady or even additional growth in Franklin and Moore counties, there would be enough water in Tims Ford Reservoir to meet future water supply demands in the Elk River area while helping to meet the needs of adjacent water service area.

V. Environmental Justice

V1. *We note that the Environmental Justice Executive Order (EO 12898) was not listed on pages 16-17 under Other Review and Permit Processes. The FEIS should list it and, more importantly, consider potential E*[nvironmental] *J*[ustice] *impacts relative to the alternatives.* **EPA, 51ag**

V2. *Page 137 discusses demographics of the project area. It appears that minority and low-income percentages are similar among project counties and lower than the state average. One exception is the Bethesda Division of Williamson County for low-income groups, which is noticeable greater (12.6%) than that of the total county (5.8%). This should be considered during infrastructure construction of the alternative. However, since the overall effect of the project would be to increase water supply in these counties, this may or may not be a great E*[nvironmental] *J*[ustice] *concern.* **EPA, 51ah**

Response to Comments V1 - V2: TVA is not subject to this Executive Order; however, TVA typically addresses environmental justice issues in the EIS documents we prepare. Accordingly, the Environmental Justice Executive Order (EO 12898) has been added to Section 1.8 in the final EIS. While potential disproportionate impacts have been considered in this study, detailed analyses cannot be conducted until more information about the location of structures and any proposed pipeline routes becomes available. This would be done as a part of the subsequent environmental review of any action alternative proposed to be constructed, depending on the extent of federal agency participation in the project. However, at this time and based on the data shown in Tables 23 and 24, we do not anticipate disproportionate impacts on any segment of the population. The discussion in Section 5.14 will be changed in the FEIS to clarify this.

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Hillman, Jim, Log No. 16; Comment B4.
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Horn, Fred H., Log No. 5: Comment H30.
Hudson, David L., Log No. 38; Comment H14.

Jacobs, Ed, Log No. 76; Comments B5, C6, G6, and H4.
Jones, Larry E., Log No. 1; Comments A9 and A35.

Lashlee, Jerry C., Log No. 26; Comments A15, C2, C16, C18, H10, and H24.
Lee, Don F., Log No. 6; Comments B1, C20, H12, and L9.
Lewis, Henry, Log No.21; Comment F6.
Lockwood, Richard E., Log No. 31; Comments A4, E28, G4, and K26.

Maddux, Ralph G., Log No. 23; Comments E14 and E36.
Marina, Marty, Executive Director, Tennessee Conservation League,
Log No. 58; Comments A40, C15, D5, E27, F17, G2, G3, H18, K5, and U4.
McDonald, Mrs. Herschel, Log No. 57; Comment S6.
McGarry, Ken, Log No. 13; Comments C21 and H16.
McKinney, Abrey, Environmental Services Division, TWRA,
Log No. 61; Comments E22, F16, And G7.
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Nannie, Linda, Chairman, Duck River Agency,
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Nannie, Linda, Chairman Duck River Agency,
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Penrod, Nancy L., Log No. 69; Comments B7 and K21.
Procter, John M., Elk/Duck River Chapter, Trout Unlimited,
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Reed, Robert N., Log No. 28; Comments H19, K22, and R5.
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Stewart, Jeff, Log No. 52; Comments F2, G18, and S4.

Tamberrino, Frank M., President, Maury Alliance, Log No. 47; Comments E15 and E42.
Tamberrino. Frank M., President, Maury Alliance,
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Tims Ford Council, Log No. 3; Comment H15.

Vaughn, Sharon, Log No. 79; Comments A5, A21, A34, B8, and E41.

Wallace, Terry, Marshall County Executive, Log No. 65; Comments C4, E5, and E11.
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Wilson, Justin P., Deputy to the Governor,
Log No. 43; Comments A10, A18, A19, B9, C1, E29, F15, G22, H2, S2, and U1.
Witherow, W, Roger, Log No. 11; Comment E9.
Wooten, Doug, Log No. 36; Comment E2.